

# Air Resources Chapter

*San Mateo County General Plan*

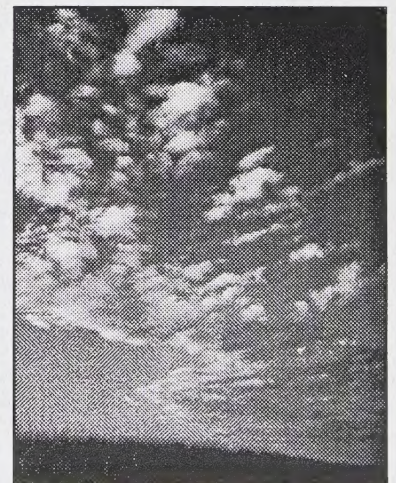


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**Environmental Services Agency**  
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**CHAPTER 17**  
**AIR RESOURCES**

**Adopted by the San Mateo County Board of Supervisors  
January 25, 1994**

**Environmental Services Agency  
Planning and Building Division  
San Mateo County, California**





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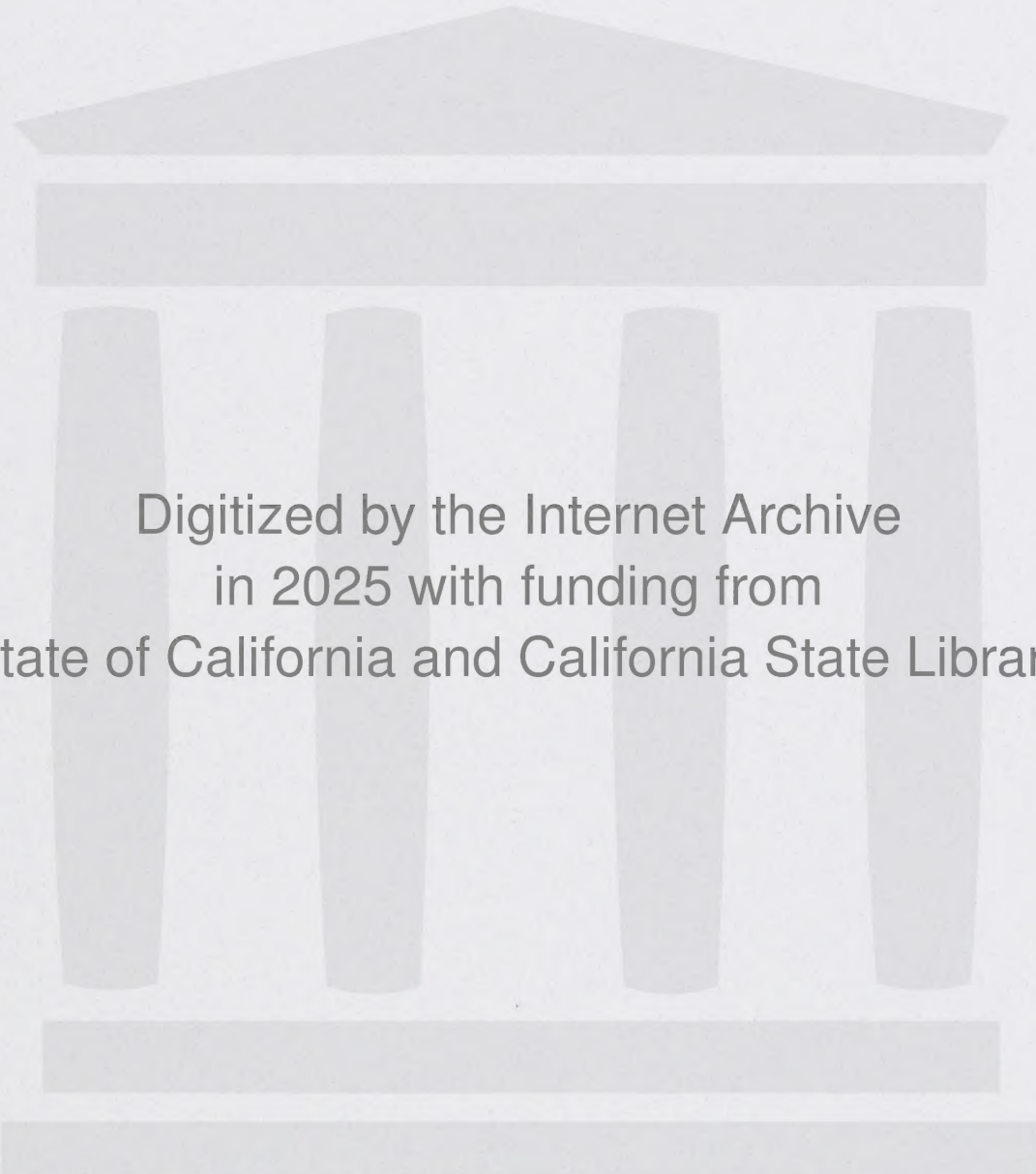




# Air Resources

Summary





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## SUMMARY

### A. BENEFITS OF A GENERAL PLAN AIR RESOURCES CHAPTER

The proposed General Plan Air Resources Chapter (Chapter) benefits local and regional efforts to improve and protect air resource quality in the following ways.

#### 1. Establish County Air Quality Measures

The Air Resources Chapter establishes measures that will help reduce the amount of air pollutants emitted within the County and will help the Bay Area attain air quality standards. The measures are based on the Chapter's analysis on the air quality effects of local land use development and transportation decisions and improvements, and include: (1) plans that do not allow sensitive receptors (e.g., schools, hospitals) and major emission sources to locate near one another to reduce public exposure to harmful air pollution, (2) regulations that ensure land use development include all applicable emission controls to reduce air pollution to the maximum practicable extent, and (3) programs the County will use to encourage other government agencies in the County to adopt similar measures.

#### 2. Information Resource for Other Agencies

The Chapter serves as an information resource other local agencies in the County can use to prepare plans, regulations, and programs that help improve air resource quality. The proposed Chapter consolidates information about air quality conditions and issues in San Mateo County into a single reference document.

#### 3. Increases Understanding About County Air Resource Conditions and Issues

The Chapter promotes better understanding about San Mateo County air resource conditions and issues. The Chapter discusses air quality issues unique to San Mateo County. It evaluates how existing plans and regulations might more effectively reduce air pollution within the County. This discussion clarifies and educates how local land use development and transportation system improvements might reduce emissions generated in San Mateo County and help the Bay Area attain air quality standards.

### B. AIR RESOURCE BACKGROUND

#### 1. Description of Existing Air Resource Conditions

San Mateo County is located along western edge of the San Francisco Bay Area air basin which includes the nine Bay Area Counties. The Bay Area Air Quality Management District (BAAQMD) monitoring stations measure air pollutant concentrations throughout the air basin and identify violations for approximately 30 federal and State air quality standards. Table 1 lists the federal and State standards for five air pollutants that are most commonly violated in metropolitan air basins. It shows that San

Mateo County air quality attains all standards except for the State suspended particulate matter (PM10) standard. It also shows that air quality elsewhere in the air basin, outside of San Mateo County, violates six air quality standards: the federal and State carbon monoxide standards, the federal and State ozone standards, and the federal and State suspended particulate matter standards.

Frequent strong westerly ocean winds keep the County's air comparatively clean by quickly diluting pollutants at their source, but they also transport pollutants to other parts of the air basin where they contribute to the Bay Area's air quality violations. The County's urban areas experience high air pollution concentrations, or "hot spots," when winds fail to disperse pollutants from their source and allow them to concentrate near their source. This problem is usually a short-term problem that usually occurs during warm summer days or cold winter nights.

About 10 percent of the air pollutants emitted within the Bay Area air basin are generated by sources within San Mateo County. Air pollution is generated by: (1) mobile sources (e.g., motor vehicles), (2) stationary sources (e.g., factories, dry cleaners), or (3) other sources (e.g., fires, agriculture, grading activity, road dust). Mobile sources are the County's most significant source of air pollution. The automobile is the most significant type of mobile source because it generates most of the County's total pollutants. Stationary sources account much smaller share of the County's total emissions. Most of the County's stationary source emissions come from employment centers located within the County's Bayshore Freeway (U.S. 101) Corridor. Other sources generate most of the County's total suspended particulate matter, but otherwise account for a very small part of the County's total emissions.

Air pollutant concentrations exceeding air quality standards are known to have adverse health effects. The general population will usually experience transitory health effects when exposed to high air pollutant concentrations for prolonged periods. These health effects include eye and respiratory tract irritation, headaches, coughing and chest pains. Children, the elderly, and the chronically or acutely ill are most susceptible to high air pollution concentrations. Because of this sensitivity, they are collectively referred to as "sensitive receptors." The ailments that are likely to occur in this group include bronchitis, emphysema, asthma, and restrictive ventilatory disease.

## 2. Description of Projected Air Resource Conditions

Although improved vehicle emission controls and fuel efficiency, and cleaner burning fuels are expected to reduce the potential for hot spot formation near congested roadways, local air quality near roadways will continue to be degraded, especially when stable atmospheric conditions occur.

By 2000, San Mateo County air quality is expected to continue to attain all federal and State air quality standards, except the State suspended particulate matter standard. Table 1 shows that air quality in the rest



**TABLE 1**  
**VIOLATIONS OF AIR QUALITY STANDARDS -**  
**SAN MATEO COUNTY AND THE BAY AREA**

Air Quality Standards for Air Pollutants Most Commonly Violated in Metropolitan Areas	Existing (1992)		Projected (2000)	
	SMCo	Bay Area	SMCo	Bay Area
Carbon Monoxide				
State		X		X
Federal		X		
Ozone				
State		X		X
Federal		X		
Suspended Particulate Matter				
State	X	X	X	X
Federal		X		X
Sulfur Dioxide				
State				
Federal				

of the air basin is expected to improve by 2000; however, Bay Area violations for four standards will continue to occur: the State carbon monoxide standard, the State ozone standard, and the federal and State suspended particulate matter standards.

With the exception of suspended particulate matter, total emissions will decrease in San Mateo County by 2000. The County's emissions will continue to account for about 10 percent of the Bay Area's total air pollutant emissions. The County's mobile sources, particularly automobiles, will continue to generate most of these emissions. BAAQMD estimates that automobiles (and other on-road vehicles) will generate 56 percent of the County total carbon monoxide, 48 percent for nitrogen oxides, and 14 percent for hydrocarbon. However, by 2000, the total emissions they generate will be one-half of 1990 levels because of improved vehicle emission controls and fuel efficiency, and cleaner burning fuels. Aircraft operations are expected to generate about 10 percent of the County total carbon monoxide, 9 percent for nitrogen oxides, and 21 percent for hydrocarbon. These figures are likely to

increase further if aircraft operations increase as a result of the proposed San Francisco International Airport expansion plan.

County residents and visitors will continue to experience air pollution related health problems if they are located in areas where emission sources are concentrated and hot spots form. The County's sensitive receptors are especially vulnerable to these problems. Elsewhere in the County, the general public and sensitive receptors will benefit from improved areawide air resource conditions.

### 3. Existing Plans, Policies, and Regulations Affecting Air Quality

There are a number of plans and regulations implemented by regional, Countywide, and local agencies which would directly or indirectly improve air resource quality in the County and the Bay Area. The key plans and regulations include: the federal Bay Area Air Quality Plan, the State Bay Area Clean Air Plan, Bay Area Regional Transportation Plan, San Mateo County Congestion Management Plan, San Mateo County Sales Tax Expenditure Plan (Measure A), and San Mateo County General Plan.

#### a. Regional Air Quality Plans and Regulations

Improved air quality is the primary goal of the federal Bay Area Air Quality Plan (1982) and the State Clean Air Plan (1992). These are regional air quality plans that prescribe how the Bay Area will attain air quality standards, and they are the basis for BAAQMD air pollution regulations. The stationary source regulations require emission control devices on point sources (e.g., smoke stacks), the sale and use of low emission commercial products (e.g., paints) and the use of low emission commercial/industrial processes (e.g., spray hoods, dry cleaning). These plans also establish transportation demand management programs that try to reduce mobile source emissions by discouraging single occupancy vehicle travel.

#### b. Regional and Countywide Plans and Regulations Affecting Air Quality

Improved air quality is an important supplemental objective of regional and Countywide transportation plans. The federal Bay Area Regional Transportation Plan (1991) guides development of the major transportation systems (e.g., freeways, transit systems) in the Bay Area. The federal Clean Air Act Amendment requires that MTC use this plan to promote projects that will help improve air quality. The San Mateo County Congestion Management Plan (1991) describes how transportation system improvements will reduce traffic congestion within San Mateo County. It also includes an Air Resource Improvement Program that recommends how City/County Association of Governments (C/CAG) can promote projects that reduce traffic congestion and mobile source emissions at the same time. The San Mateo County Sales Tax Expenditure Plan (Measure A) established a source of funds to build Countywide transportation system improvements (e.g., CalTrain railroad grade separations, roadway improvements) and fund transportation system management (TSM) activities. Although the primary intent of this plan



is to reduce commute-related traffic congestion, its objective is also to reduce emissions generated by mobile sources.

c. County General Plan

The existing San Mateo County General Plan includes many land use and transportation policies which also help improve air quality (e.g., coordinated land use/transportation development, urban infill development within transportation corridors).

C. AIR RESOURCE ISSUES

1. Automobile and Other Vehicles

Emissions from mobile automobiles, buses, trucks, and aircraft have a huge impact on air resource quality within the County and the Bay Area. Automobile emission control devices have significantly reduced mobile source emissions in the Bay Area during the last 20 years, despite increased automobile travel. More recently, other controls such as improved vehicle fuel efficiency, reformulated cleaner-burning fuels, and smog inspection programs have also reduced mobile source emissions. These emissions can be reduced further by taking older automobiles out of operation. Pre-1978 automobiles generate more emissions per mile than any other type of vehicle operating on the road. Additional reductions can be achieved by (1) requiring emissions control devices on all vehicles, including diesel buses and trucks, and (2) by limiting aircraft idling during landing/take-off operations.

More stringent statewide vehicle emission requirements are needed to spur continued development of emission control technology and high-mileage and alternative fuel vehicles, as well as increased smog inspection requirements to encourage drivers to retire their older vehicles. Aircraft landing/take-off operations could be modified to limit aircraft idling and reduce aircraft emissions.

2. Economic Activity

The County's economy includes business activities that generate stationary source emissions which degrade local air resource quality and contribute to the Bay Area's ozone problem. The amount of emissions these sources release into the atmosphere has been significantly reduced by using emission control devices on smoke stacks, reformulating volatile liquids, and by developing low-emission commercial/manufacturing processes. It is expected these controls will continue to help improve future air resource quality. However, long-term economic growth may partially offset the overall air resource improvement they produce.

The long-term air resource improvement produced by stationary source controls would be maintained to a greater extent if BAAQMD and the County: (1) require best available emission devices and low emission products and processes; (2) increase monitoring and enforcement activities; and (3) coordinate and enhance CEQA's air quality assessment procedures.

### 3. Land Use Development

Major land use developments, like regional shopping malls or the international airports, are "indirect sources" of air pollution, because they attract enough automobile trips to determine where and when mobile source emissions occur in the County. These emissions can be reduced by using a number of different indirect source controls to discourage automobile travel and encourage transit travel. For example, mixed use development within residential areas, employment centers or near transit would allow people to complete daily errands by walking and not driving. Indirect source controls will produce long-term air quality benefits provided reduced automobile travel is tied to other important community objectives such as reduced traffic congestion, more affordable housing, open space protection, and efficient use of infrastructure and services.

The County's land use plans and development regulations could be amended to include indirect source controls which: (1) plan high density, mixed use development near transit stations and commercial areas; (2) require land use development to include transit, pedestrian and bicycle improvements; (3) reduce parking requirements in areas served by transit; and (4) locate neighborhood-serving businesses in residential areas and employment centers. Successful development of these measures will depend on BAAQMD and ABAG providing technical assistance to local agencies.

### 4. Transportation System

Transportation system performance (e.g., capacity, congestion) largely determines the location and intensity of mobile source emissions in the County. Improvements such as traffic management systems, high occupancy vehicle (HOV) facilities, and increased transit service can reduce mobile source emissions by increasing the system's carrying capacity, provided they do not attract additional automobile trips. These improvements have their greatest emissions reductions in congested transportation corridors (e.g., U.S. 101) when they are supported by indirect source controls and transportation demand management programs.

The County could help improve transportation system performance by promoting a Countywide transportation program that plans all improvements within the County to reduce traffic congestion and mobile source emissions at the same time. The program should also be consistent with regional air quality plans to ensure that it will help attain air quality standards.

### 5. Travel Behavior

People choose to travel by automobile because of the speed and ease it offers. Automobile travel accounts for a large share of the region's mobile source emissions. Transportation demand management (TDM) measures can modify this travel behavior. These measures were primarily developed to reduce traffic congestion by persuading people not to drive alone and to limit travel during commute periods. Examples of TDMs include transit subsidies, carpool programs, increased bridge tolls, and flexible work schedules. Their greatest mobile source emissions reduction potential is



realized when they are widely implemented and are supported by complementary indirect source controls and transportation system improvements.

Travel behavior in the County can be modified to a greater extent if TDMs, indirect source controls, and transportation improvements where coordinated by a single Countywide plan. The County could encourage a Countywide planning process to integrate the San Mateo County TSM Plan, the CMP, Measure A projects, and other transportation related plans/programs together to promote less single occupancy vehicle travel and greater transit use, consistent with regional air quality goals. The process would culminate in a Countywide transportation plan that would ensure these various plans and programs would promote non-single occupancy travel to the greatest extent possible and, over the long-term, help reduce mobile source emissions and traffic congestion at the same time.

#### D. AIR RESOURCES POLICIES

##### 1. Goals and Objectives

The Chapter's Goals and Objectives policies state the County intends to: (1) protect and preserve clean air as a natural resource, (2) reduce air pollutant emissions, and (3) reduce public exposure to harmful air pollution. These goals and objectives are based on the County's intent to protect public health conditions, biologic stability, private property and community character, and visual quality from air pollution. They are also consistent with federal and State air quality planning goals to reduce harmful air pollution in the Bay Area.

##### 2. Definitions and Designations

The Definitions and Designations policies clarify the scope and meaning of policy related terms used by the Chapter's policies. The key designations include Significant Emission Sources and Transit Corridors. Significant Emission Sources are where harmful air pollution hot spots are likely to be found (e.g., high volume, congested roadways and stationary area and point sources). Transit Corridors are where existing bus and rail transit facilities are located and where urban land use development can help reduce mobile source emissions by supporting transit use.

##### 3. Regulation of Development

The Regulation of Development policies provide the authority the County needs to develop specific regulations it can use to reduce stationary and mobile source emissions generated in the County's unincorporated areas. In other words, these policies specify how through regulations Air Resource Goals and Objectives will be achieved, as follows.

###### a. Reduce Air Pollutants, Odor and Dust from Stationary Sources by Regulating Land Use Development (Policy 15)

This policy ensures that new development does not degrade local air quality and that it includes stationary source emission controls. It requires that all development (excluding agriculture): (1) use dust

control measures to reduce suspended particulate emissions, and (2) comply with all applicable BAAQMD stationary source controls to reduce air pollutants, odors and dust. It also calls for the County to develop improved coordination with BAAQMD to ensure their air quality permit program is implemented as effectively as possible within the County. These actions will ensure that stationary source emissions are reduced to the maximum practicable extent.

b. Reduce Public Exposure to Air Pollutants, Offensive Odors and Dust by Land Use Planning (Policy 16)

This policy directs the County to minimize the air quality impacts of land use development by preparing land use plans and zoning regulations that: (1) promote development of sensitive receptors in areas where harmful air pollution and odors do not occur, (2) establish buffer zones between sensitive receptors and significant emission sources, and (3) allow stationary sources to locate in areas designated by the General Plan for industrial and commercial development. These policies strengthen existing policies and regulations that protect land uses adjacent to sewage treatment plants, landfill sites, and chemical manufacturing facilities, and will help reduce public exposure to harmful air pollutants and odor nuisance complaints over the long term.

c. Reduce Mobile Source Pollutants by Integrating Land Use and Transportation Planning (Policy 17)

This policy includes a number of actions intended to reduce mobile source emissions by integrating land use and transportation planning in the County's development plans and regulations to a greater extent. The policy directs the County to prepare land use plans that (1) maximize residential and office development densities within 1/4 mile of transit stations and commercial areas, (2) locate neighborhood commercial/service areas in or adjacent to residential and office employment areas, (3) direct infill development in all urban areas, (4) provide for direct and safe pedestrian and bicycle facilities (e.g., sidewalks, street crossings, and paths) access from residential neighborhoods to transit stations and commercial areas. This policy also requires that land use development in transit corridors, where adequate levels of service are provided by other transportation systems, incorporate indirect source controls such as transit shelters, pedestrian paths, and preferential parking. These actions will help reduce mobile source emissions by establishing land use patterns where transit travel and walking and bicycling are both efficient and enjoyable modes of travel for commute trips and for personal errands. In the long-run, this policy will help improve air quality in commercial and employment areas, particularly those served by congested roadways.

4. Program Responsibilities

Program Responsibilities policies identify: (1) actions other than regulations the County needs to complete to achieve the Chapter's goals



and objectives, and (2) actions the County will encourage other agencies to complete to ensure the County's policies are fully and effectively implemented.

a. Role of the County

These policies establish actions for the County that do not involve establishing regulations. They include: (1) revising existing County policies, programs and regulations to be consistent with, but not duplicate, regional air quality plans, (2) requesting increased by coordination between the County and the BAAQMD, (3) using County facilities to demonstrate low-emission practices, and (4) fostering greater understanding about County air resource conditions and issues. These actions ensure County regulations will help reduce emissions from all sources to the maximum practicable extent, and they will encourage cities within the County to develop air quality policies.

b. Role of Other Agencies

These policies direct the County to encourage other agencies to implement plans, programs and regulations that will help achieve the Chapter's goals and objectives Countywide. They identify a number of specific actions that the County will encourage regional and Countywide agencies to complete. First, the County will encourage C/CAG and SamTrans to facilitate a planning process to develop a Countywide Transportation Plan. This plan would coordinate all TDM programs and transportation plans in the County and ensure they are consistent with County and regional air quality objectives. Second, these policies encourage transit agencies (mainly SamTrans) and BAAQMD to participate in the County's development review process. This will help the County require that all land use development projects provide appropriate on-site transit improvements and install all required stationary emission control devices. These policies help improve the effectiveness of a number of regional and local plans, programs and regulations. They will also ensure that local land use development and transportation system improvements will help improve air resource quality to the maximum practicable extent.





# Air Resources

Background ■ Issues







# AIR RESOURCES BACKGROUND

## I. INTRODUCTION

Air quality affects the health and welfare of every San Mateo County resident. The combined influence of the County's marine climate and its topography have blessed it with high quality air resources. However, increased urban development and roadway congestion have generated emissions that have degraded the County's air resources. The resulting polluted air poses a significant threat to persons with cardio-respiratory ailments. It also contributes to the deterioration of materials, and damages plants and animals. Especially vulnerable to poor air quality are the elderly, the chronically and acutely ill, and young children. Clean air is essential to maintaining the quality of life in San Mateo County and the Bay Area and is, therefore, a primary concern of the General Plan.

## A. SCOPE AND ROLE

This chapter comprehensively discusses air resources in San Mateo County. It describes the factors that affect air resource quality, analyzes the planning issues that contribute to the protection of this resource, and develops policy and implementation programs that will protect air resources in the County's unincorporated areas.

## B. STATE PLANNING LAW

State planning law does not require the County to include an air resources chapter in the General Plan. This chapter is an optional General Plan Element prepared in compliance with the State Government Code, Sections 65300.5 and 65303, which requires this chapter to be consistent with the policies contained in the other chapters of the General Plan.

## C. RELATION TO OTHER GENERAL PLAN DOCUMENTS

### 1. San Mateo County General Plan (1986)

A number of policies in the other chapters of the San Mateo County General Plan (1986) establish goals and objectives that also fulfill air resource planning objectives. The most notable are those in the Urban Land Use and Transportation Chapters that would reduce the number of automobile trips and protect the public from exposure to air pollution. This Chapter consolidates General Plan policies related to air resources.

The San Mateo County General Plan EIR, Air Quality Background and Issues Report, evaluates the environmental effects the plan would have on County air resources. It describes existing air quality conditions in San Mateo County, examines existing air resource policies and regulations, and assesses the potential air resource impacts of General Plan

policies. This Chapter incorporates many of the General Plan EIR mitigation measures as air resource policy.

2. Local Coastal Program (1980)

The Local Coastal Program Energy Component (1980) requires the County to conform with State air regulations. This chapter establishes policy requiring compliance with State air quality regulations throughout the unincorporated area, including the Coastal Zone.

D. RELATION TO REGIONAL PLANS

1. Bay Area Air Quality Plan (1979, 1982)

The Bay Area Air Quality Plan is a regional plan jointly prepared by the Metropolitan Transportation Commission (MTC), Association of Bay Area Governments (ABAG) and the Bay Area Air Quality Management District (BAAQMD) for the California Air Resources Board (CARB) to help the Bay Area attain federal air quality standards. It contains numerous stationary source control, motor vehicle emission control, and transportation system improvement measures that would reduce the amount of air pollutants released into the atmosphere. These measures are implemented within the Bay Area Region by BAAQMD and MTC. This chapter contains policy which support the air quality objectives of the Bay Area Air Quality Plan including the air quality regulations of the Code of Federal Regulations (CFR Title 40).

2. Bay Area Clean Air Plan (1991)

The Bay Area Clean Air Plan (CAP) is a regional plan governing the entire County. It is used by the BAAQMD to regulate air pollution emissions from stationary and mobile sources within the County as well as the Bay Area. This chapter implements one of the CAP's transportation control measures that encourages local governments to adopt General Plan Air Quality Elements.

3. Toxic Air Contaminant Control Program

The Toxic Air Contaminant Control Program is a regional program administered by the BAAQMD which governs the entire County. Its main objective is to reduce public exposure to toxic air contaminants. This chapter contains policies which support the air quality objectives of the program.

4. Odorous Substances Regulation

The BAAQMD adopted the Odorous Substances Regulation (Regulation 7) to generally limit the use of odorous substances and impose specific controls for emission of certain odorous compounds in the Bay Area, including the County. The regulation is intended to help the public identify and control offensive odors that are not otherwise controlled by other federal or State air quality laws. This chapter includes policies which support the land use planning objectives of Regulation 7.



## E. DEFINITIONS

The following are definitions of some of the air resource terminology used in this Chapter.

**AIR RESOURCES** - Air resources are that part of the earth's atmosphere that plants, animals and people breathe outside of buildings and which mix with and disperse emissions generated by natural and man-made sources.

**AIR QUALITY STANDARDS** - Air quality standards are specific ambient air pollutant concentration thresholds established by the California Air Resources Board and the federal Environmental Protection Agency. Concentrations above these thresholds damage human health and materials. Meeting these standards is a goal of air pollution control plans.

**AIR POLLUTION** - Air pollution is the by-product of a variety of processes including fuel combustion, industrial and commercial processing, and petroleum product and solvent evaporation that degrade air resources.

**AMBIENT AIR QUALITY** - Ambient air quality is a measure of air resource condition based on the concentration of criteria pollutants counted in the atmosphere during a limited time period. Usually, ambient air quality is expressed in terms of the number of criteria pollutant molecules found per million oxygen molecules sampled during a one-hour or eight-hour period.

**ATMOSPHERIC INVERSION** - Atmospheric inversion is a meteorological condition where distinct air temperature/density boundaries are formed between the lower and upper atmosphere, trapping any type of air pollutant in the air near the earth's surface.

**CONGESTED ROAD MILES** - The number of freeway and highway miles within the County where automobile traffic is congested, e.g., level of service D or less, during weekday commute periods, as identified in the San Mateo County Congestion Management Plan "Road Network."

**CRITERIA POLLUTANTS** - Criteria pollutants are specific air pollutants regulated by State and federal law to protect the public from adverse health affects due to air pollution. The five major criteria pollutants that are commonly exceeded in urban areas include carbon monoxide, ozone, suspended particulate matter (PM10), nitrogen dioxide, and sulphur dioxide. The other criteria pollutants which do not commonly exceed these standards include sulfates, lead, hydrogen sulfide and vinyl chloride.

**INDIRECT SOURCES** - Indirect sources are major land uses that attract a large number of motor vehicles which concentrate mobile source emissions on nearby roadways and intersections. Examples of indirect sources include large employment and shopping centers, regional airports, and schools. An indirect source may also be a stationary source, e.g., a

factory that emits a large amount of pollutants and employs a large number of employees who drive to work.

**MOBILE SOURCES** - Mobile sources are motor vehicles that emit air pollutants and include "on-road" vehicles (e.g., motorcycles, automobiles, light and heavy duty trucks, heavy duty buses), "off-road" vehicles (e.g., utility equipment, farm equipment, heavy and light duty industrial/construction equipment, locomotives, off-road motorcycles, ships and boats), and aircraft. Concentrations of mobile sources on regularly congested roadways can be further defined as "line" sources.

**POINT SOURCES** - Point sources are a subset of stationary sources and include individual, industrial or commercial facilities that emit more than 2.5 tons of air pollutants into the atmosphere per year and obtain a BAAQMD permit to operate.

**PRIMARY POLLUTANT** - Primary pollutants are air pollutants that immediately degrade air resource quality when they are emitted into the atmosphere. Examples include carbon monoxide, PM10, sulfur dioxide, and in some cases, nitrogen dioxide.

**SECONDARY POLLUTANT** - Secondary pollutants are air pollutants that degrade air resource quality only after they have mixed with or reacted with an existing constituent of the atmosphere. Examples include ozone, and in some cases, nitrogen dioxide.

**SENSITIVE RECEPTORS** - Any land use commonly associated with persons apt to suffer adverse health affects when exposed to air pollutants especially children, the elderly, and other persons suffering from chronic or acute respiratory illness. Also, sensitive receptors may be any facility or land use commonly associated with these persons including schools, playgrounds, child care centers, retirement homes, convalescent homes, hospitals and clinics.

**STATIONARY SOURCES** - Stationary sources are industrial or commercial processes that emit air pollutants into the atmosphere. Stationary sources include industrial and commercial areas where air pollutants are regularly emitted by fixed vents or stacks. Stationary sources include "point" sources (e.g., industrial/commercial facilities that include processes or equipment that generate large amounts of pollutants), and "area" sources which include products, processes and activities that produce small amounts of pollutants.

**TOXIC AIR CONTAMINANTS** - Toxic air contaminants (TAC) include approximately 200 airborne chemicals emitted by stationary and mobile sources which may pose a public health risk when concentrated in the air.



## II. DESCRIPTION OF EXISTING AIR RESOURCE CONDITIONS

### A. EXISTING AMBIENT AIR QUALITY

Air resource quality in San Mateo County and the Bay Area has improved steadily since State and federal air pollution control regulations came into effect in 1970.<sup>1</sup> With the exception of suspended particulate matter (PM10), there have been no violations of State and federal criteria pollutant standards in San Mateo County.<sup>2</sup> However, other portions of the Bay Area regularly violate the carbon monoxide and ozone standards as well as the PM10 standard.

The current State and federal ambient air pollution concentration standards are listed in Table 1. The BAAQMD collects data from its monitoring stations to determine Bay Area compliance with State and federal standards and to prepare the air pollutant concentration maps shown in Figures 1 to 6. Table 2 describes each pollutant and their typical emission sources and health effects. Table 3 shows the estimated amount of pollutants emitted during 1990 by emission sources located within San Mateo County.

#### 1. Carbon Monoxide

In general, high ambient carbon monoxide concentration is a local rather than an areawide air pollution problem. Carbon monoxide is a colorless, odorless byproduct of fuel combustion. It is a primary pollutant that is not readily dispersed by the atmosphere from its emission source. High carbon monoxide concentrations at specific sites, or hot spots, are strongly influenced by local roadway traffic, climate, and topography.<sup>3</sup> Carbon monoxide hot spots are generally found within urban areas 1,600 feet of congested arterial and within 3,200 feet of congested freeways<sup>4</sup> where the ambient 8 hour CO concentration exceeds 6 ppm.<sup>5</sup>

Ambient carbon monoxide levels have decreased steadily in San Mateo County and the Bay Area. No violations have been recorded in the County whereas elsewhere in the Bay Area two were recorded in 1990 and five in 1983. The highest Bay Area carbon monoxide concentrations occur over San Francisco and San Jose where urban development is most intense. Figures 1 and 2 show that in San Mateo County, these peaks produce somewhat elevated concentrations in the South Bayside and in the northern part of the North County.

Over 90 percent of the County's estimated total carbon monoxide emissions are generated by mobile sources, primarily on-road sources (e.g., automobiles). The remainder are from stationary and other sources.

#### 2. Ozone and Ozone Precursors

Ozone is an areawide air pollution problem. It is not directly emitted by any single source. Rather, it is a secondary pollutant that is formed in the atmosphere through a complex photochemical reaction between reactive hydrocarbons (RHC) and nitrogen oxides (NOx).

**TABLE 1**  
**STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	California Standard <sup>/3</sup>	Federal Standards <sup>/2</sup>	
			Primary <sup>/4</sup>	Secondary <sup>/5</sup>
Ozone (O <sub>x</sub> )	1-hour	0.09 ppm (180 ug/m <sup>3</sup> )	0.12 ppm (235 ug/m <sup>3</sup> )	0.12 ppm (235 ug/m <sup>3</sup> )
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )
	8-hour	9 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
Nitrogen Dioxide (NO <sub>x</sub> )	1-hour	0.25 ppm (470 mg/m <sup>3</sup> )	---	---
	Annual Average	---	0.053 ppm (100 ug/m <sup>3</sup> )	0.053 (100 mg/m <sup>3</sup> )
Suspended Particulate Matter (PM <sub>10</sub> )	24-hour	50 ug/m <sup>3</sup>	150 ug/m <sup>3</sup>	150 ug/m <sup>3</sup>
	Annual Geometric Mean	30 ug/m <sup>3</sup>	---	---
	Annual Arithmetic Mean	---	50 ug/m <sup>3</sup>	50 ug/m <sup>3</sup>
Sulfur Dioxide (SO <sub>2</sub> )	1-hour	0.25 ppm (655 mg/m <sup>3</sup> )	---	---
	3-hour	---	---	1300 ug/m <sup>3</sup> (0.5 ppm)
	24-hour	0.05 ppm <sup>/6</sup> (131 ug/m <sup>3</sup> )	365 ug/m <sup>3</sup> (0.14 ppm)	---
	Annual Average	---	80 ug/m <sup>3</sup> (0.03 ppm)	---

TABLE 2

AIR POLLUTANT SOURCES AND HEALTH EFFECTS

POLLUTANT	DESCRIPTION	SOURCE	HEALTH EFFECT
Carbon Monoxide (CO)	Primary pollutant formed by incomplete fuel combustion.	Exhaust from automobiles and industrial processes.	Impaired central nervous system functions, fatigue, headache, confusion, and dizziness and, at high concentrations, death.
Ozone (O <sub>3</sub> )	Secondary pollutant formed by photochemical reaction between reactive hydrocarbon (RHC) and nitrogen oxides (NO <sub>x</sub> ) in the presence of sunshine.	Exhaust from automobiles and industrial processes are sources of ozone precursors. Ozone is not emitted by any source.	Eye irritation, impaired respiratory function.
Suspended Particulate Matter (PM <sub>10</sub> )	Primary pollutant formed by natural or man-made activities that entrain small particles into the atmosphere.	Wind blown soil, roadway dust entrained by automobiles, and industrial (and residential) smokestack ash.	Increased risk of chronic respiratory disease; when combined with SO <sub>2</sub> , altered lung function of sensitive receptors.
Nitrogen Dioxide (NO <sub>2</sub> )	Either a primary pollutant formed by fuel combustion or a secondary pollutant formed by photochemical reaction with nitrogen oxides (NO <sub>x</sub> ).	Exhaust from automobiles and industrial processes.	Increased risk of acute and chronic respiratory disease.
Sulfur Dioxide (SO <sub>2</sub> )	Primary pollutant formed by combustion of sulfur containing fuels; SO <sub>2</sub> then oxidizes to form SO <sub>3</sub> which combines with moisture to form a sulfuric acid mist.	Exhaust from automobiles and industrial processes.	Aggravated asthmatic symptoms and cardio-pulmonary disease; Impaired lung functions.
Toxic Air Contaminants (TAC)	TAC includes approximately 200 airborne chemicals, including lead and vinyl chloride, which expose population to health risks even at low concentrations.	Exhaust from automobiles and industrial processes	Increased risk of cancer and other adverse health affects including impairment of blood function and nerve construction and behavioral and learning problems in children.
Odorous Substances	Any offensive odor which may become a public nuisance when the intensity and duration of the exposure is great.	Gas compounds (e.g., hydrogen sulfide, butyric acid, mercaptan and phenolic compounds) released by industrial and commercial facilities.	None.



TABLE 3

SAN MATEO COUNTY 1990 AIR POLLUTANT EMISSIONS (TONS PER DAY)<sup>1</sup>

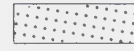
<u>SOURCES</u>	<u>OZONE PRECURSORS</u>						<u>SUSPENDED PARTICULATE MATTER</u>		<u>SULFUR DIOXIDE</u>	
	<u>CARBON MONOXIDE</u>		<u>REACTIVE HYDROCARBONS</u>		<u>NITROGEN OXIDES</u>					
Mobile Sources	281.99	92.6%	36.90	49.7%	51.85	91.2%	6.43	5.7%	4.02	91.8%
On-Road	(221.35)	(72.7%)	(27.58)	(37.1%)	(35.88)	(63.1%)	(5.91)	(5.3%)	(2.88)	(65.8%)
Off-Road	(43.35)	(14.2%)	(4.76)	(6.4%)	(7.72)	(13.6%)	(0.51)	(0.5%)	(1.11)	(25.3%)
Aircraft	(17.29)	(5.7%)	(4.56)	(6.1%)	(8.25)	(14.5%)	(0.01)	(0.0%)	(0.03)	(0.7%)
Stationary Sources	21.60	7.1%	17.27	23.2%	4.96	8.7%	7.04	6.3%	0.36	8.2%
Point <sup>2</sup>	(1.04)	(0.3%)	(3.97)	(5.3%)	(0.93)	(1.6%)	(1.90)	(1.7%)	(0.21)	(4.8%)
Area <sup>3</sup>	(20.56)	(6.8%)	(13.30)	(17.9%)	(4.03)	(7.1%)	(5.14)	(4.6%)	(0.15)	(3.4%)
Other Sources	0.84	0.3%	20.13	27.1%	0.02	0.0%	98.36	88.0%	0.00	0.0%
TOTALS	304.43	100%	74.30	100%	56.83	100%	111.83	100%	4.38	100%

1. BAAQMD, Emission Source Planning Inventory - San Mateo County, 1991.
2. Point Sources include the following Emission Source Planning Inventory categories: industrial/commercial processes/facilities; chemical manufacturing facilities; other industrial/commercial processes/facilities; fuels distribution.
3. Area Source includes the following Emission Source Planning Inventory categories: petroleum product/solvent evaporation.

# AIR RESOURCES QUALITY

CARBON MONOXIDE

1-HOUR BACKGROUND VALUES (ppm) - 1989



3-6 ppm



9-12 ppm



6-9 ppm



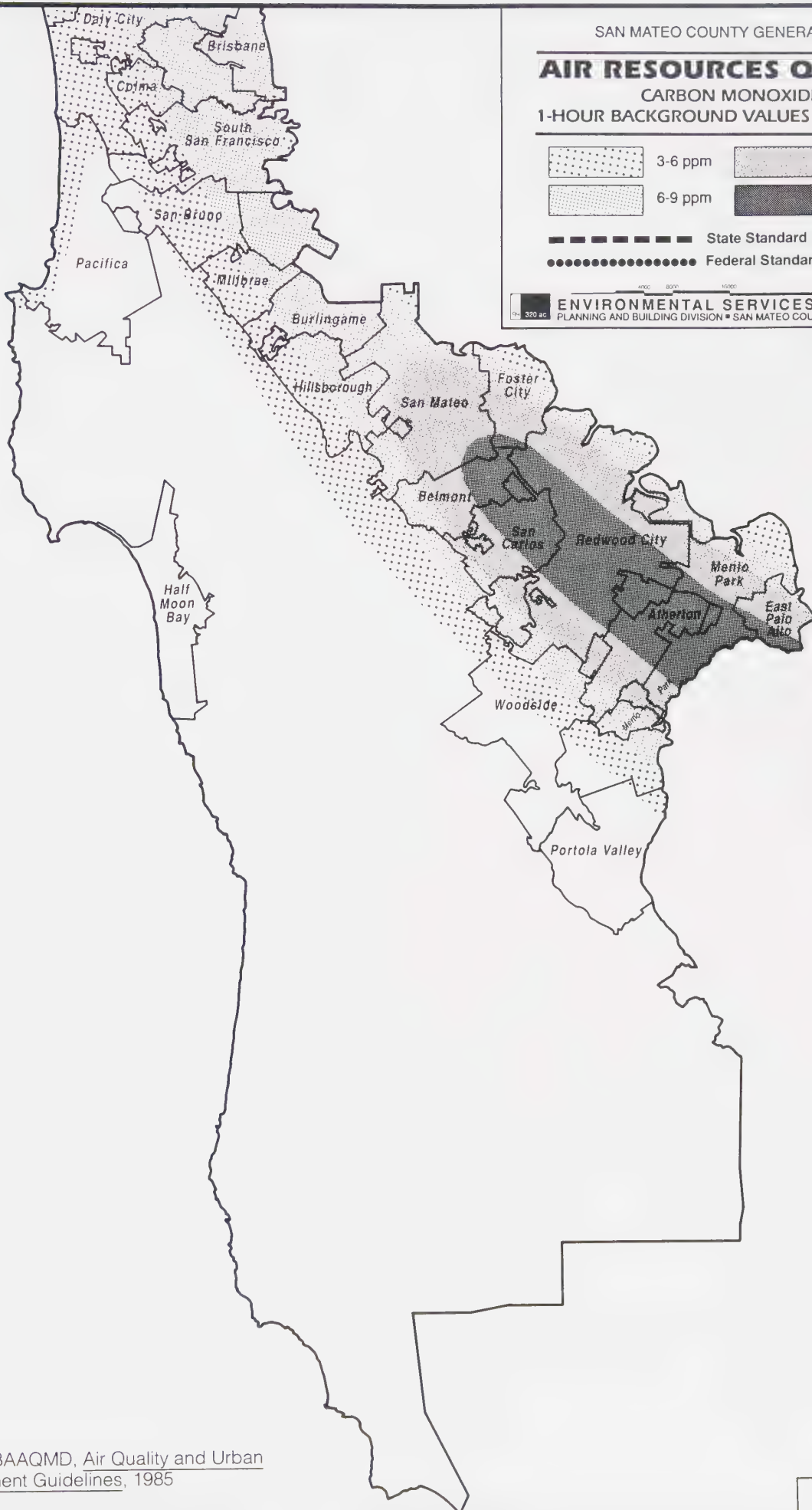
12-15 ppm

----- State Standard

..... Federal Standard



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Source: BAAQMD, Air Quality and Urban Development Guidelines, 1985

Figure no. 1





# AIR RESOURCES QUALITY

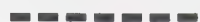
CARBON MONOXIDE  
8-HOUR BACKGROUND VALUES (ppm) - 1989



3-6 ppm



6-9 ppm



State Standard

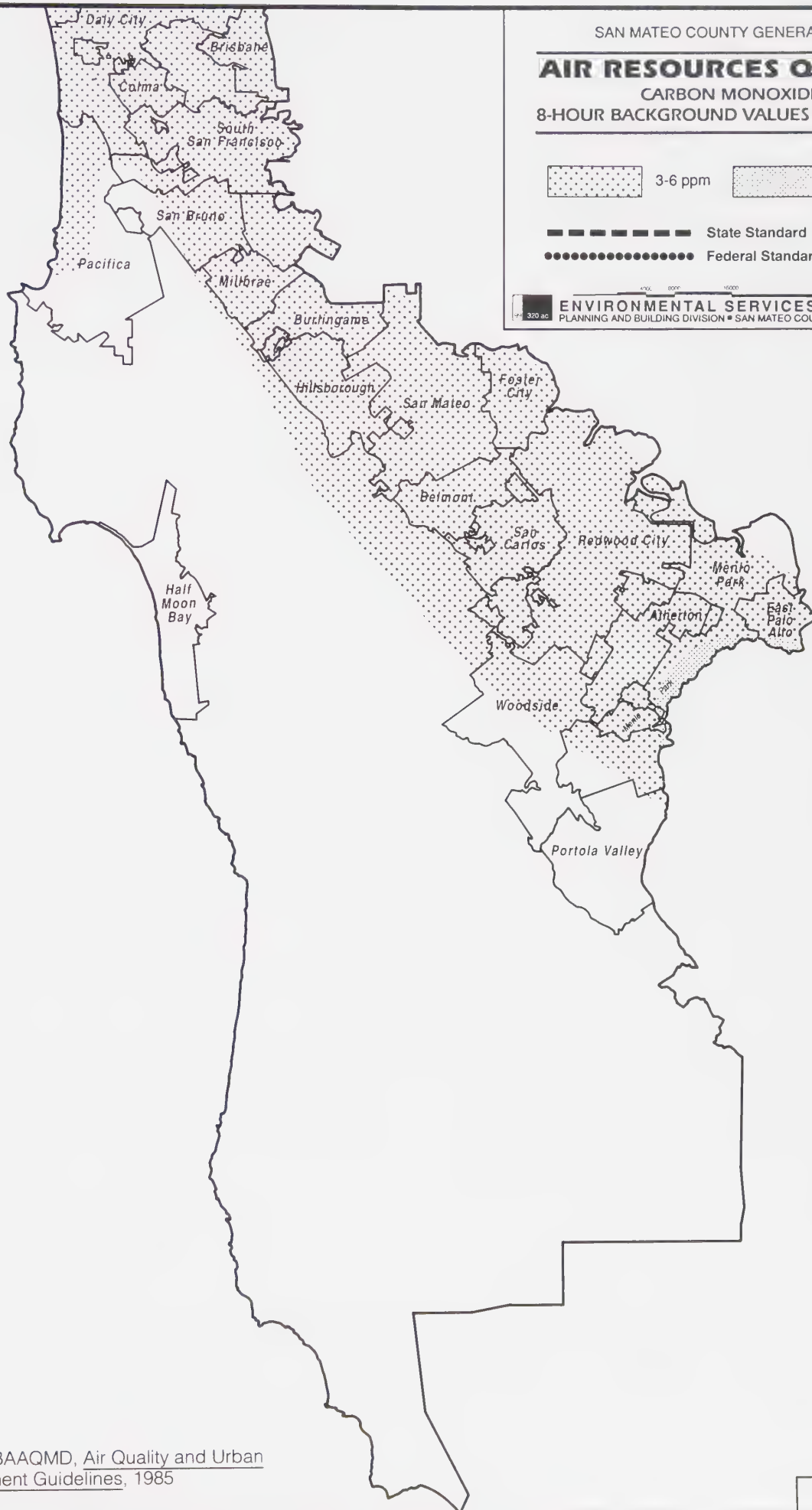


Federal Standard



0 3200 6400  
0 1000 2000 3000 4000 FEET

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Source: BAAQMD, Air Quality and Urban  
Development Guidelines, 1985

Figure no. 2



RHC and NO<sub>x</sub>, commonly referred to as "ozone precursors," are primary pollutants that are emitted directly into the atmosphere. Often, they are generated and transported by wind to other locations within the Bay Area before they react to form ozone. Therefore, ozone reduction techniques must rely on reducing ozone precursor emissions.

Ozone levels in San Mateo County have met State and federal standards since 1983, when two violations were recorded.<sup>6</sup> In comparison, the other Bay Area counties recorded 53 violations in 1983 and 14 in 1990. Figure 3 illustrates that ambient ozone values generally increase inland from the coast by showing significantly lower ozone values on the Coastside than on the Bayside.

Most of the County's total ozone precursor emissions (e.g., 50 percent of RHC and 92 percent of NO<sub>x</sub>) are generated by mobile sources, primarily on-road vehicles. Stationary sources and other emission sources emit a much smaller share of the County's total ozone precursor emissions.

### 3. Suspended Particulate Matter

Suspended particulate matter (PM<sub>10</sub>) is a primary pollutant that is generated by activities which produce or disturb dust which remain suspended in the air. It is known to cause respiratory problems and to reduce atmospheric clarity.

The State suspended particulate standard is routinely violated throughout the urbanized part of the Bay Area, including the County. In 1988, the suspended particulate standard measure was changed from total suspended particulates (TSP) to suspended particulate matter less than 10 microns in diameter (PM<sub>10</sub>).<sup>7</sup> The new PM<sub>10</sub> standard measures about 50 percent of the total suspended particulates in the atmosphere and has substantially reduced the number of violations in the Bay Area and the County. For instance, in 1983, 37 TSP violations were recorded in the County, while in 1990, 8 PM<sub>10</sub> violations were recorded. Figure 4 shows that the South Bayside, Mid-Bayside and North County areas exceed State standards while Figure 5 shows that they are below federal standards. The Coastside area is well below both the State and federal standards.

Almost all of the PM<sub>10</sub> (88 percent) emissions within San Mateo County are generated by "other" sources. Road dust disturbed by on-road vehicles accounts for the largest share (60 percent) of the County's total PM<sub>10</sub>. PM<sub>10</sub> generated by construction site accidental fires, and agricultural activities account for the remainder. The amount of each of these "other" sources generate is not known and will vary from year to year. Mobile and stationary sources contribute a small part of the County's total PM<sub>10</sub> emissions.

### 4. Nitrogen Dioxide

Nitrogen dioxide is both a primary pollutant and a secondary pollutant that degrades ambient air quality at specific sites within the County as well as Countywide. As a primary pollutant, it is the byproduct of fuel combustion that degrades ambient air quality near its source,

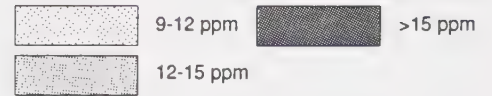




# AIR RESOURCES QUALITY

## OZONE

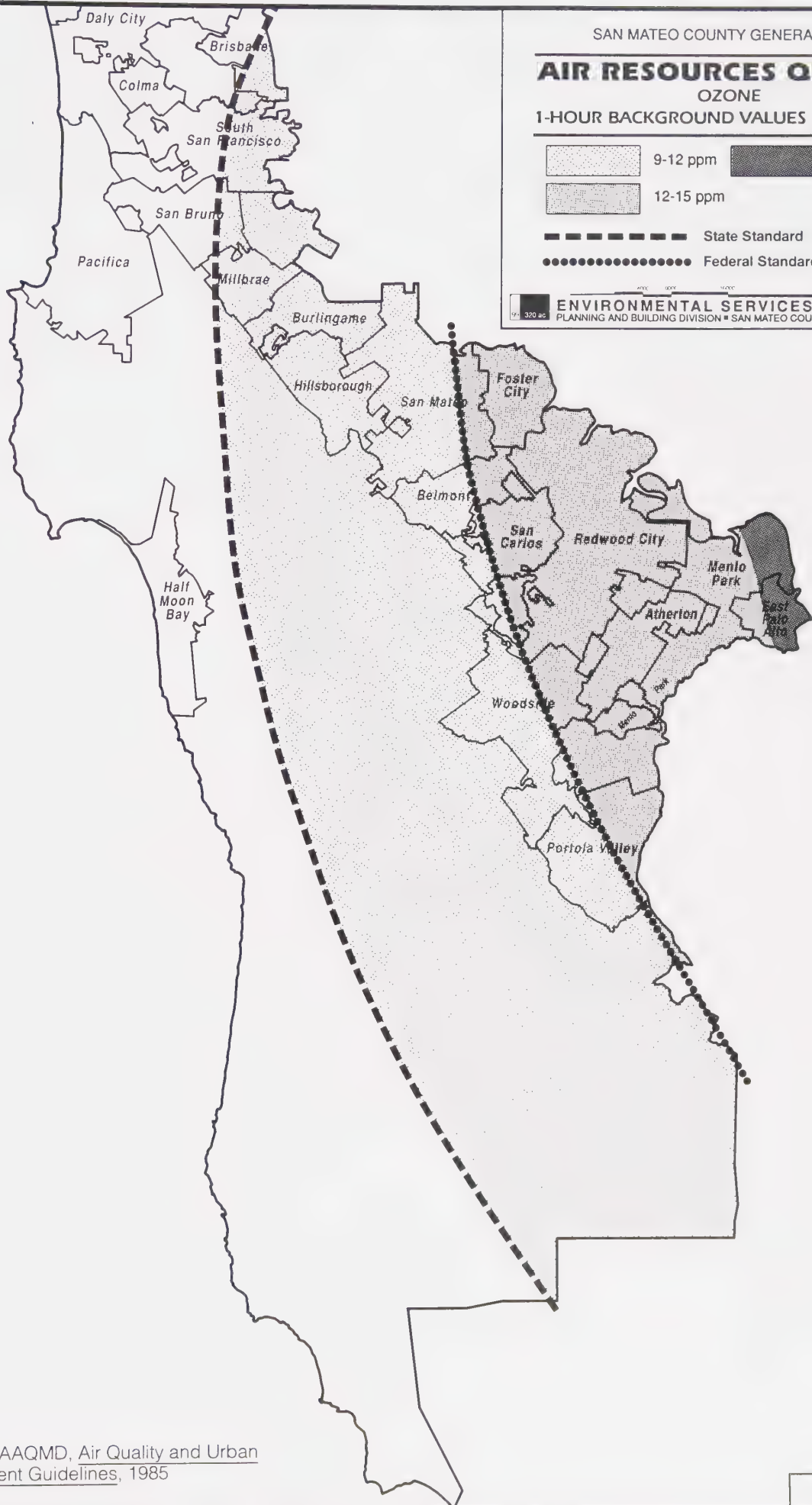
1-HOUR BACKGROUND VALUES (ppm) - 1984



----- State Standard

..... Federal Standard

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Source: BAAQMD, Air Quality and Urban Development Guidelines, 1985

Figure no. 3





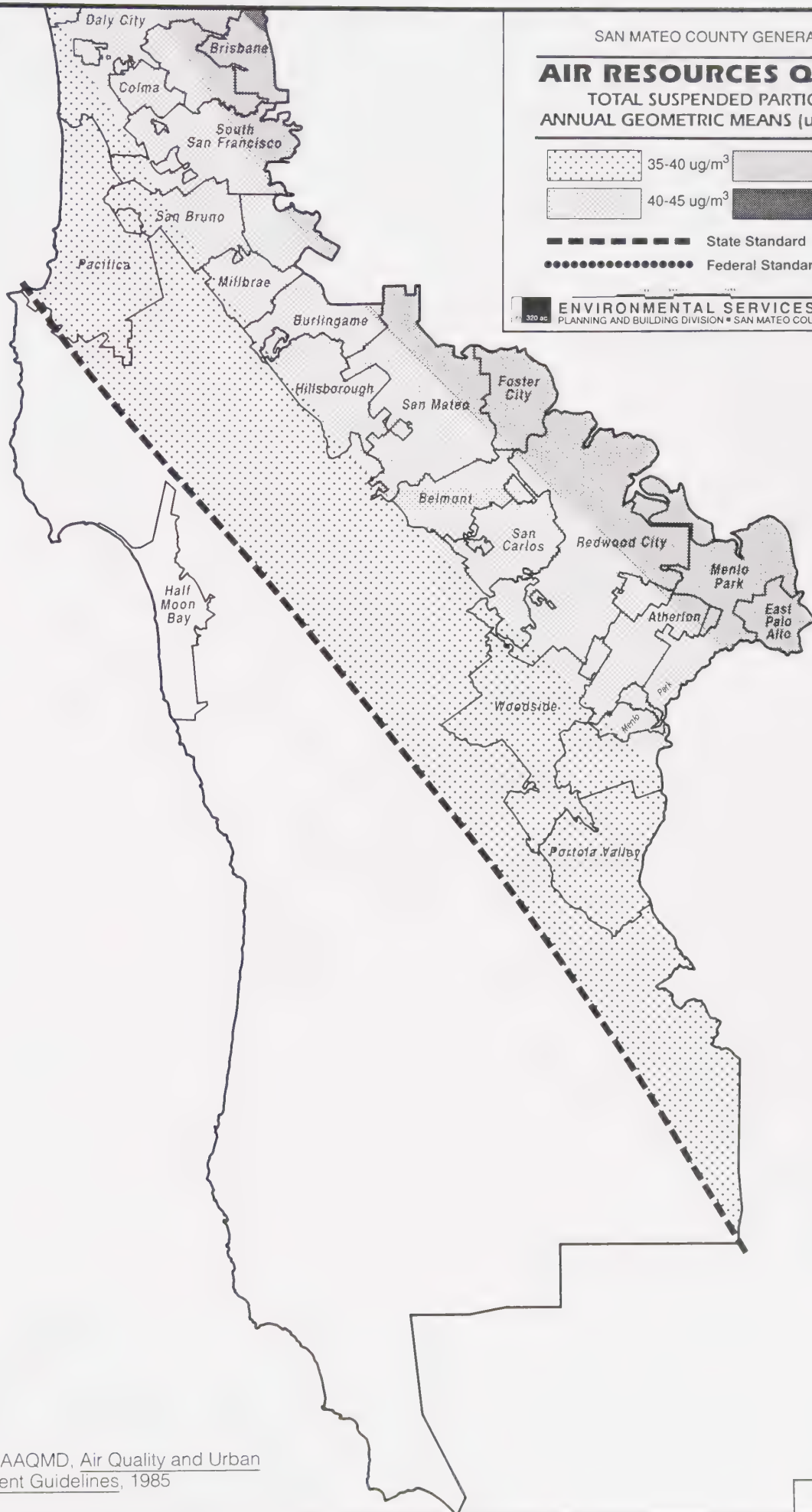
# AIR RESOURCES QUALITY

TOTAL SUSPENDED PARTICULATE  
ANNUAL GEOMETRIC MEANS ( $\mu\text{g}/\text{m}^3$ ) - 1982



----- State Standard  
..... Federal Standard

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Source: BAAQMD, Air Quality and Urban Development Guidelines, 1985

Figure no. 4



# **AIR RESOURCES QUALITY**

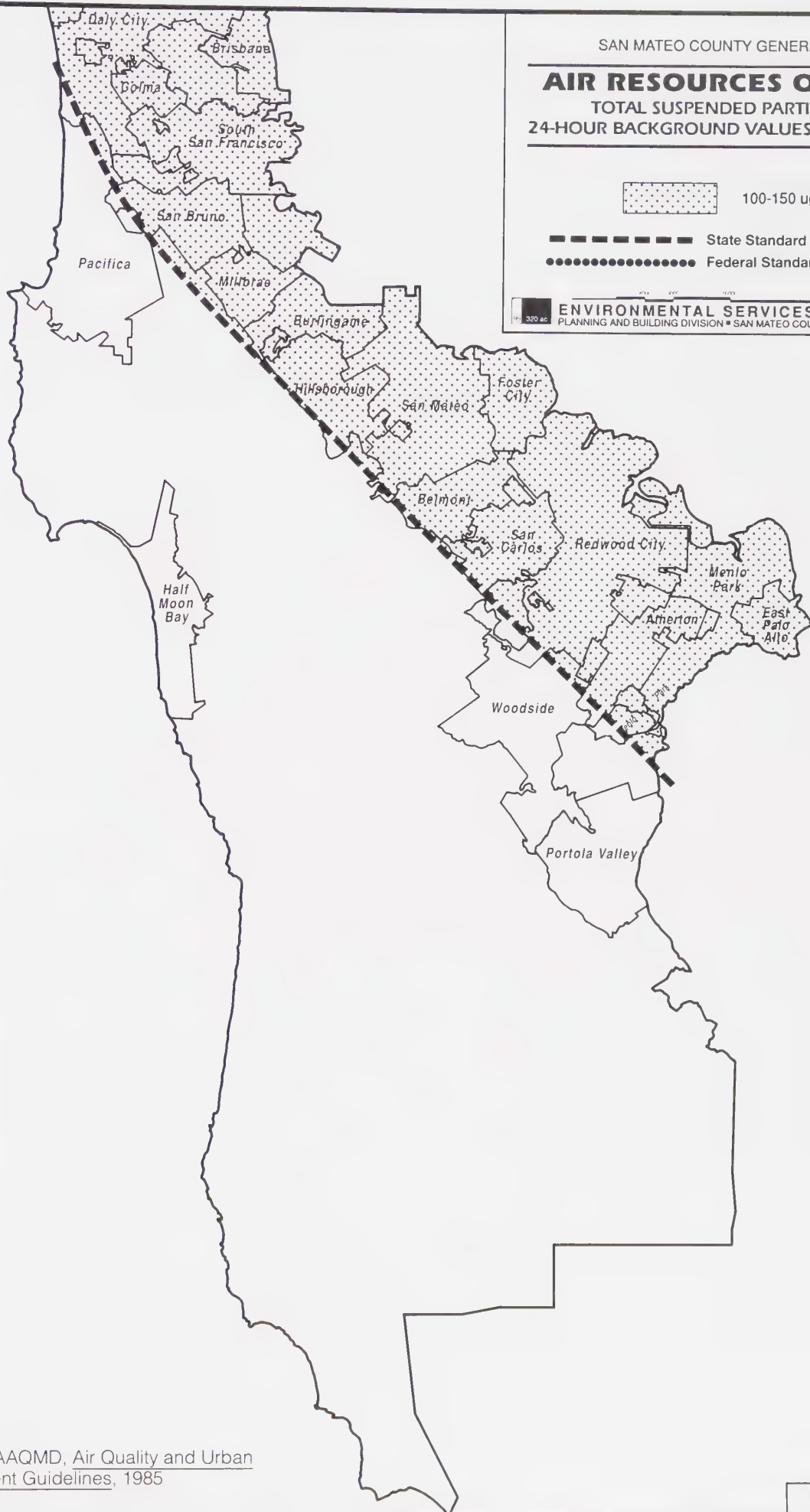
## TOTAL SUSPENDED PARTICULATE 24-HOUR BACKGROUND VALUES ( $\mu\text{g}\cdot\text{m}^3$ ) - 1984

 100-150  $\mu\text{g}/\text{m}^3$

----- State Standard

..... Federal Standard

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Source: BAAQMD, Air Quality and Urban Development Guidelines, 1985

Figure no. 5





especially congested roadways. As a secondary pollutant, it is readily converted into other nitrogen oxides (and back again) to react with carbon monoxide to form ozone.

Nitrogen dioxide standards have not been violated within the Bay Area since 1980. Figure 6 shows that nitrogen dioxide concentration is greatest over San Jose.

Because of the chemically reactive properties of nitrogen dioxide, BAAQMD emission source estimates include all nitrogen oxides as a surrogate measure for the presence of nitrogen dioxide. Almost all (91 percent) of the County's total nitrogen oxides emissions are generated by mobile sources, particularly on-road vehicles. Stationary sources account for a small part of the County's total nitrogen oxides emissions.

## 5. Sulfur Dioxide

Sulfur dioxide is a primary pollutant that is an air pollution problem at sites where fuel combustion associated with heavy industry and shipping activities is concentrated. The greatest concentration of sulfur dioxide occurs in the northern Bay Area counties where most of the region's oil refining, heavy industry, power generation, and shipping occurs. Ambient sulfur dioxide concentrations in San Mateo County are insignificant.

Sulfur dioxide standards have not been violated within the Bay Area since 1983. Ambient air quality records show that ambient sulfur dioxide concentrations rarely approach either the State or federal standards.

Almost all (92 percent) of the County's total sulfur dioxide emissions are generated by mobile sources, particularly on-road vehicles which account for two-thirds of the total. Stationary sources emit a small part of the County's total.

## 6. Toxic Air Contaminants (TAC)

Toxic air contaminant (TAC) emissions are primary air pollutants that are a localized rather than a regional air quality problem.<sup>8</sup> High local concentrations above regional ambient levels, or "hot spots," can be found at sites near congested roadways where on-road vehicle TAC emissions are concentrated, or near stationary "point" sources where paint, solvent, and chemical use may release TAC emissions. A small amount of these emissions that may significantly increase the potential for health problems in the local population.

In 1990, BAAQMD's regional ambient air sampling monitors detected 11 of the 200 TAC that are screened by the District.<sup>9</sup> The data collected by these monitors indicate that: (1) regional ambient TAC concentrations are low and do not violate federal or State standards; (2) TAC concentrations throughout the Bay Area are relatively constant (including San Mateo County); and (3) the potential for TAC hot spot formation is greatest near known TAC emission sources.<sup>10</sup>



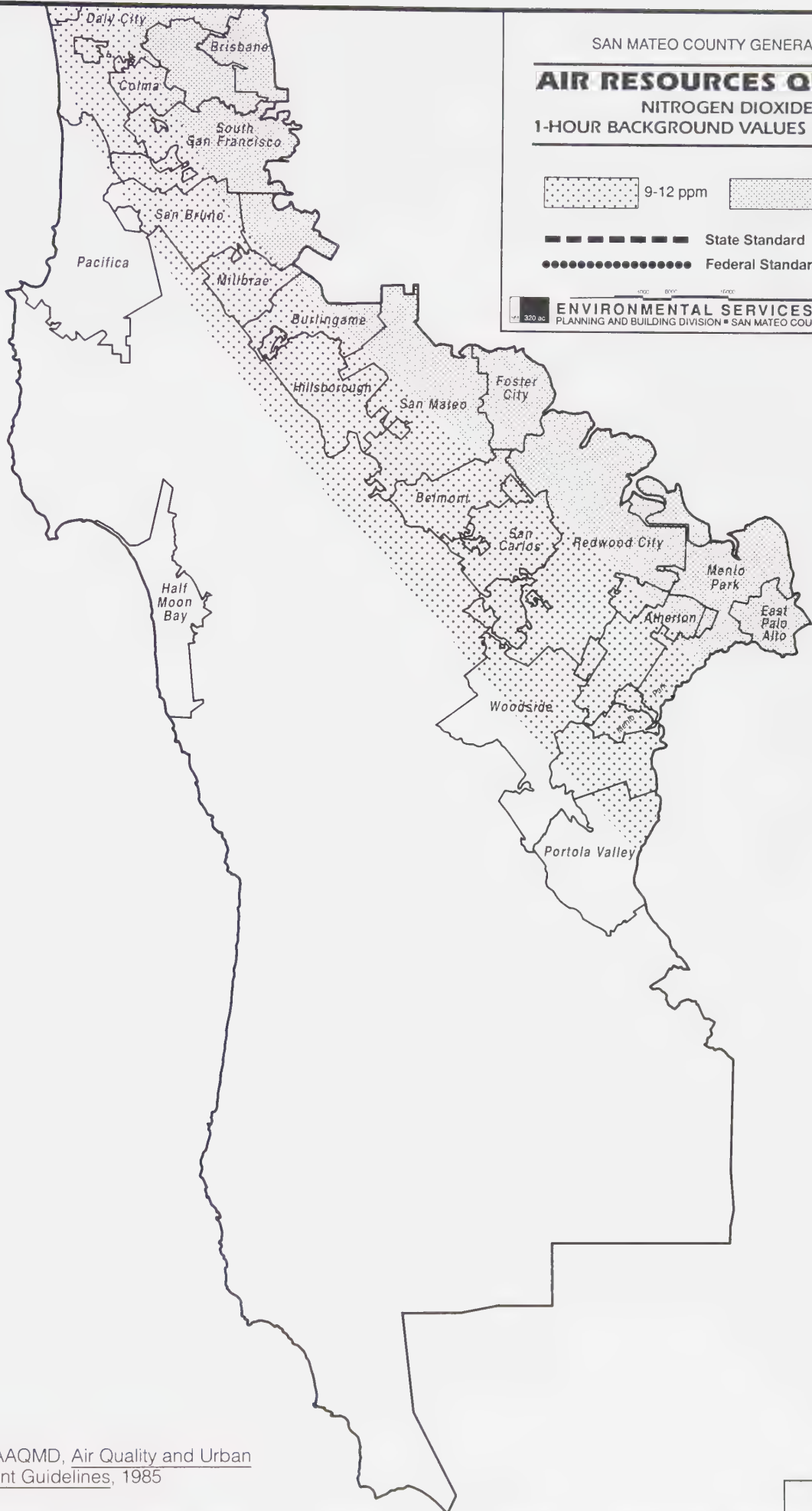


# AIR RESOURCES QUALITY

NITROGEN DIOXIDE  
1-HOUR BACKGROUND VALUES (ppm) - 1984



0 1000 2000 3000 FEET  
320 ac  
**ENVIRONMENTAL SERVICES AGENCY**  
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Source: BAAQMD, Air Quality and Urban Development Guidelines, 1985

Figure no. 6



Mobile sources generate about 60 percent of the TAC emissions in San Mateo County and stationary sources generate the remaining 40 percent.<sup>11</sup> Most of the stationary source TAC emissions are generated by the County's stationary "area" sources. These "area" sources are shown in Figure 7 and include industrial or commercial districts where facilities that use paints, solvents, and chemicals are located. This figure also shows 9 stationary "point" sources that increase health risks to nearby population because of their potential to form TAC hot spots and their location near residential areas.<sup>12</sup> These "point" sources generate a very small share of the total County TAC emissions.

#### 7. Odorous Substances

Odor emissions are a localized air quality problem. Atmospheric release of certain gas compounds (e.g., hydrogen sulfide gas, butyric acid, mercaptan and phenolic compounds) by industrial or commercial facilities can cause odors that may be offensive for persons located nearby.<sup>13</sup> Although they seldom cause physical harm to these persons, offensive odors can become a significant public nuisance when the intensity and duration of the exposure is great.

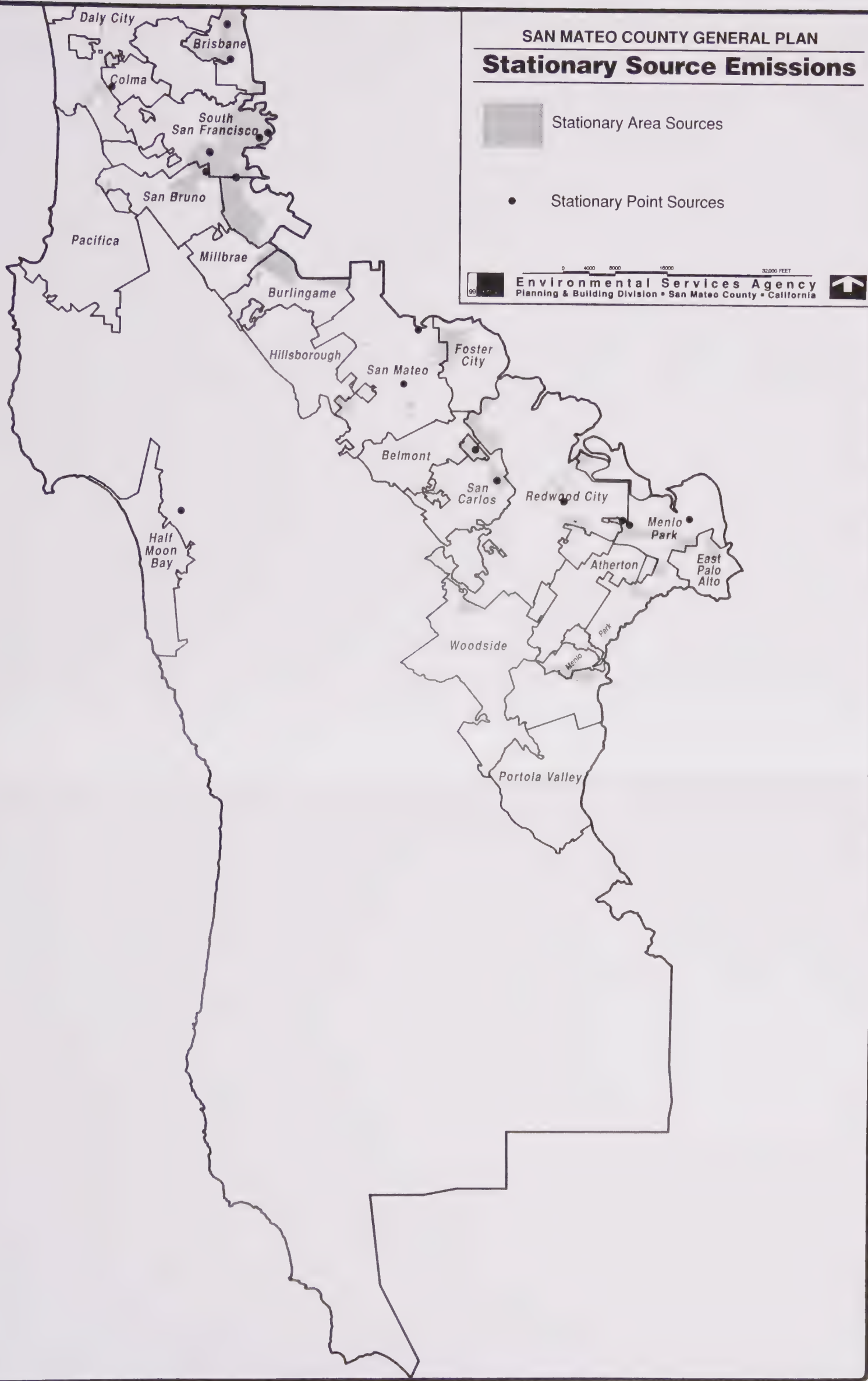
In 1990, BAAQMD received about 125 complaints about offensive odors from stationary sources located in San Mateo County.<sup>14</sup> Eight of these complaints lead to BAAQMD citations. Typically, complaints regarding odors are from residents near such sources as a chemical manufacturer, auto-body shop or a sewage treatment plant.

#### 8. Other Air Pollutants

The measured ambient concentration for other air pollutants within the County and Bay Area are not significant. BAAQMD monitoring records for sulfates, lead, hydrogen sulfide and vinyl chloride show that the Bay Area has not exceeded State and federal ambient air quality standards for these air pollutants. BAAQMD does not estimate emission sources for these pollutants.



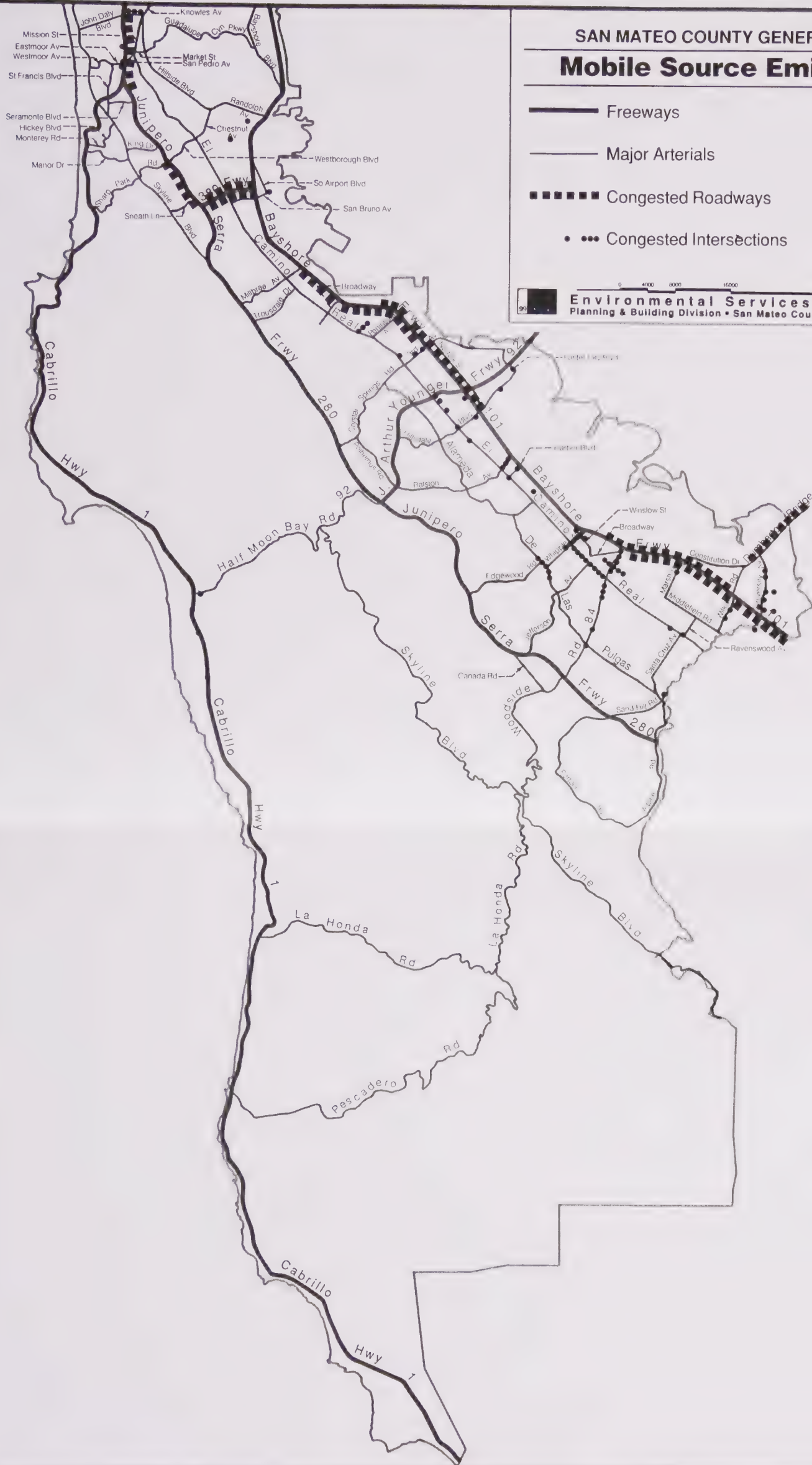




# SAN MATEO COUNTY GENERAL PLAN Mobile Source Emissions

- Freeways
- Major Arterials
- Congested Roadways
- Congested Intersections

0 4000 8000 16000 32000 FEET  
Environmental Services Agency  
Planning & Building Division • San Mateo County • California







## B. EXISTING AIR POLLUTION POTENTIAL

Air pollution becomes an increased air quality problem when the atmosphere fails to disperse air pollutants from their source. The potential for high air pollutant concentration is determined by local climatic conditions and topography and by the concentration of emission sources. Table 4 summarizes how local climate and topography in the County's sub-areas (e.g., North County, Mid-Bayside, South Bayside and Coastside) can either disperse emissions areawide or concentrate emissions locally and form air pollution "hot spots." Table 3 lists County emissions and their source and Figures 7 and 8 show where these sources are concentrated within the County.

### 1. Local Climatic Conditions and Topography

#### a. Wind

Winds are responsible for the atmosphere's ability to disperse air pollutants areawide from their source which will dilute them with large volumes of air and, thereby, sufficiently reduce their concentration. However, where light surface winds flow down sheltered valleys during the evening, air pollutants can be concentrated sufficiently enough to degrade local air resource quality. The prevailing wind in San Mateo County is a light to moderate wind from the northwest, which usually disperses and dilutes pollutants emitted into the atmosphere. It is generated by air flowing from a high pressure system over the northern Pacific Ocean to inland areas of the State. This wind intensifies in the afternoon during the spring and summer as inland temperatures mount. Its speed and direction are relatively constant during this period.

Occasionally, during the summer and autumn, a warm and dry wind from the northeast will blow when the Pacific High has positioned itself over the North American Continent. This condition usually lasts about two to three weeks, causing high temperatures and degrading ambient air quality. In general, autumn is the calmest time of the year, because the prevailing winds diminish due to cooling in the inland areas. During this period, the atmosphere is relatively stable and ambient air pollution increases significantly. The Pacific High usually begins its shift southward at this time, clearing a path that brings intense storms and winds to the County during the winter, sweeping any air pollutant away from its source.

#### b. Sunlight

Sunlight, when combined with warm temperatures, causes hydrocarbons and oxides to react to form ozone or smog. The frequency of sunlight, or cloudless days during the spring and summer, varies throughout the County and is primarily determined by the incidence of fog. The Coastside experiences morning low fog more than 60 percent of the time and afternoon fog more than 40 percent of the

TABLE 4

SAN MATEO COUNTY AIR POLLUTION POTENTIAL

Area	Local Topography and Climatic Conditions					Emission Source Concentration	Pollution Potential <sup>1</sup>
	Topography <sup>2</sup>	Wind Strength	Sunlight Frequency <sup>3</sup>	Temperature Summer, Winter	Inversion Base Height <sup>4</sup>		
<u>North County</u>	Plain	Strong	Low	Cool, Cool	Medium	High	Low
	Bayside	Strong	Moderate	Cool, Cool	Low	High	Medium
<u>Mid-Bayside</u>	Bayside	Strong	Moderate	Cool, Cool	Low	High	Medium
	Plain	Strong	High	Warm, Cool	Medium	High	Medium
	Foothills	Moderate	High	Warm, Warm	Medium	Low	Medium
<u>South Bayside</u>	Bayside	Strong	High	Cool, Cool	Low	Low	Medium
	Plain	Light	High	Warm, Cold	Medium	High	High
	Foothills	Moderate	High	Warm, Warm	Medium	Low	High
<u>Coastside</u>	Plain	Strong	Low	Cool, Cool	Medium	Low	Low
	Mountains	Moderate	Low	Mild, Cold	High	Low	Low

1. A qualitative ranking based on the combined effect topography, wind, sunlight, temperature, and inversion base height have on the potential for air pollutants concentration.
2. Topography designations derived from San Mateo County Planning Department, "The Physical Setting of San Mateo County, Chapter II, The Earth," June 1972; and, Sunset Books, "Sunset Western Garden Book, Climate Zones," 1967.
3. Based on frequency of afternoon fog observed during June, July and August, 1952. Low equals fog frequency greater than 50 percent, medium equals 30 to 50 percent, high equals less than 30 percent. Clyde P. Patton, "Climatology of Summer Fogs in the San Francisco Bay Area," University of California Publications in Geography, 10(3): 113-200, 1956.
4. Inversion height designations correspond to typical fall inversion base height above mean sea level during an afternoon stagnation episode; Low equals base height less than 200 meters; Medium is between 200 and 500 meters; and, High is greater than 500 meters. Derived from BAAQMD, "Air Quality and Urban Development Guidelines for Assessing Impacts of Projects and Plans," Figure V-C-4, November, 1985.



time. This rate is slightly less for the North County and significantly less in the Mid-Bayside and South Bayside areas. During the spring and summer, sunlight is most prevalent in the South Bayside and the Mid-Bayside areas. The frequency of sunlight and cloudless days during autumn and winter is about the same throughout the County.

c. Temperature

Warm temperatures near the earth's surface facilitate the formation of ozone, while cold temperatures near the earth's surface help form atmospheric inversions that trap air pollutants in the air people breathe. San Mateo County's mild average temperature is due to the constant flow of cool, moist marine air from the Pacific Ocean. Average maximum temperature is 64 degrees in the Coastsides and North County, 72 degrees in the Mid-Bayside and 80 degrees in the South Bayside. The marine air responsible for cool Coastsides and North County summer temperatures is also responsible for their mild winter temperatures. The average mean minimum temperature in January for the Coastsides and the North County is 42 degrees, while it is 40 degrees or less for the Mid-Bayside and South Bayside areas. Because these areas are located farther inland away from the moderating influence of marine air, they are consistently warmer during the summer and cooler during the winter.

d. Atmospheric Inversions

Atmospheric inversions create very stable air cells that trap and concentrate air pollutants close to the earth's surface. Two different types of inversions occur: temperature inversions and surface inversions. Temperature inversions form during the morning and afternoon hours throughout summer and autumn. They form when warm air from the upper atmosphere settles on and traps the cool, surface-level marine air below. Surface inversions (also referred to as radiation inversion) occur during the winter months on cold, clear nights when the earth's surface cools the air layer nearest to it and leaves a warmer air layer aloft. Temperature inversions can also occur during calm winter afternoons.

Both types of inversions commonly occur in the Mid-Bayside and South Bayside areas where the winds are relatively light and where summer and winter temperatures are more extreme. They are not common in the Coastsides and the North County where constant wind and mild temperatures prohibit their formation.

e. Topography

Local topography modifies regional climatic conditions to create local climatic variation and, thereby, affects the atmosphere's ability to disperse or concentrate air pollutants. The Santa Cruz Mountain Range is the most significant topographic feature within the County, traversing the County from north to south and rising to

2,000 feet. It blocks marine air from entering the South Bayside where sunshine and stable atmospheric conditions are common. The Crystal Springs and the San Bruno Gaps within the range allow cool, fog-bearing winds to enter the Mid-Bayside where they upset atmospheric stability and disrupt inversion formation. This range does not shelter the Coastside or the North County from marine air and, therefore, leaves these areas exposed to constant northwest wind that keeps temperatures cool, upsets atmospheric stability and disrupts inversion formation.

## 2. Emission Sources

The BAAQMD estimates the amount of air pollutants emitted daily by different sources (e.g., mobile, stationary and other) within the County and the Bay Area. This estimate is based on household, employment, land use and travel demand data provided by ABAG and MTC. Table 3 lists the estimated amount of air pollutants emitted by sources located within San Mateo County in 1990 and Figure 9 illustrates air pollutant emission trends between 1990 and 2010.

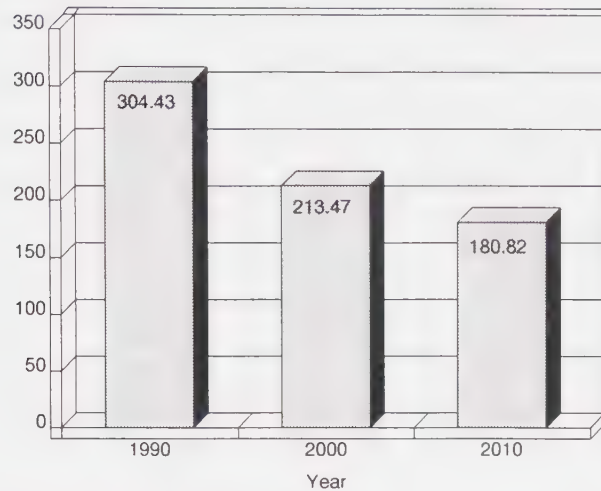
### a. Mobile Sources

Mobile sources are the most significant source of air pollutants within San Mateo County. Table 3 shows that mobile sources (on-road, off-highway and aircraft) generate almost all of the carbon monoxide (93 percent) and nitrogen oxides (91 percent), and one-half of the reactive hydrocarbons (50 percent). Although the total amount of TAC emissions is not known, sample data collected by BAAQMD indicate mobile sources generate most of the toxic air contaminants (65 percent). On-road vehicle sources, alone, generate a large share of the County's total emissions including 73 percent of carbon monoxide, 37 percent of the reactive hydrocarbons, 63 percent of nitrogen oxides, and 42 percent of the TAC. This table also shows that off-road vehicles (including farm equipment) and aircraft generate a much smaller portion of the County's total emissions. Figure 8 shows mobile source emissions are concentrated along portions of Woodside Road (84), the Bayshore Freeway (101), Junipero Serra Freeway (280) and Interstate 380 where automobile traffic volume and congestion are greatest.

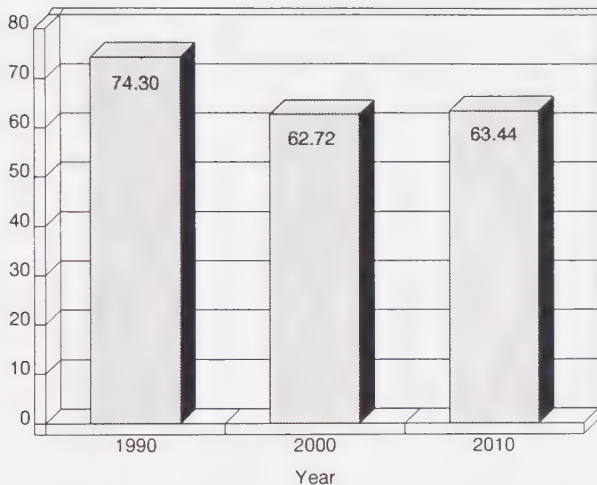
On-road vehicles contribute a significant part of the total air pollutants that degrade air resource quality within the County. They are significant emission sources because County residents rely almost exclusively on automobiles for transportation. Table 5 shows that in 1987, County residents collectively owned 471,400 automobiles. In 1987, County residents produced 1.8 million person trips by automobile or transit and amassed 13.3 million vehicle miles of travel (VMT) on a typical workday.<sup>15</sup> Of the total trips, 486,200 (27 percent) were work trips (e.g., home to work, or work to home) and 1,313,500 (73 percent) were trips for other purposes than work (e.g., shopping, errands, and social/recreational activities). About 94 percent of all work trips were by automobile (77 percent

**Figure 9: San Mateo County 1990-2010 Air Pollution Emission Trend (average tons per day)<sup>(1)</sup>**

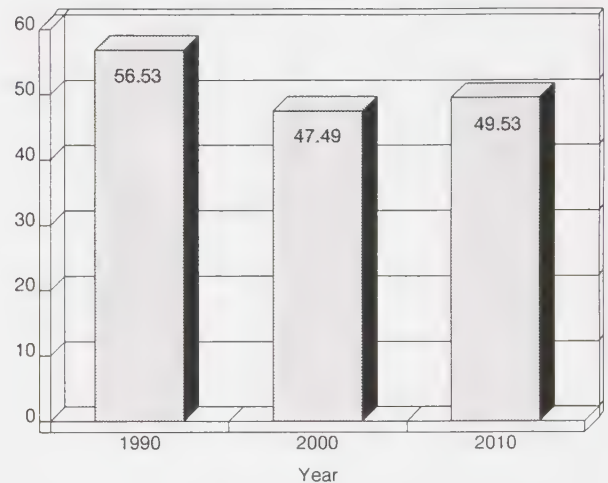
**Carbon Monoxide (CO)**



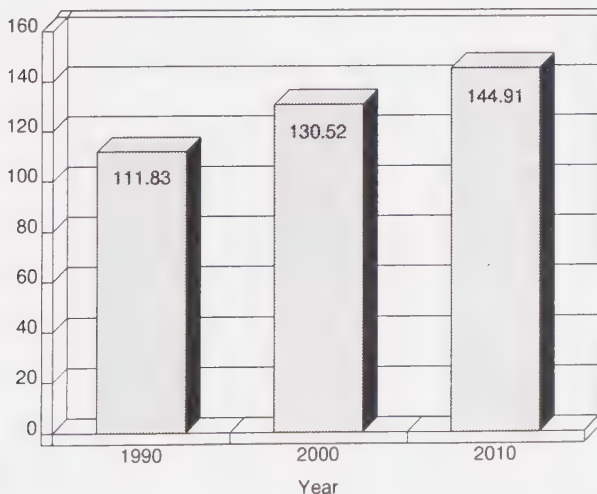
**Reactive Hydrocarbons (RHC)**



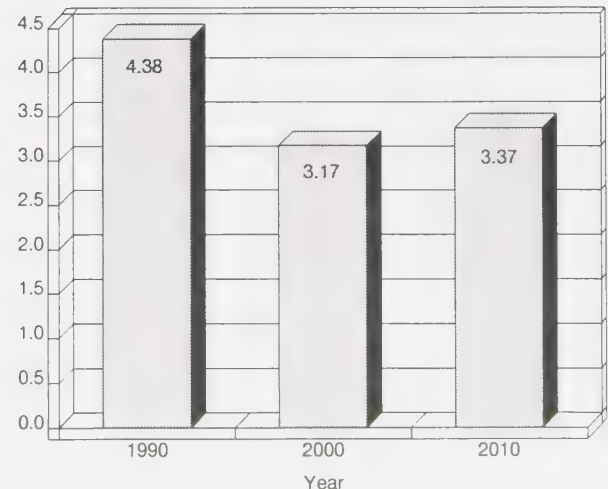
**Nitrogen Oxides (NO<sub>x</sub>)**



**Suspended Particulate Matter (PM<sub>10</sub>)**



**Sulfur Dioxide (SO<sub>2</sub>)**



<sup>(1)</sup> Bay Area Air Management District, Emission Inventory - San Mateo County, 1991





**TABLE 5**  
**SAN MATEO COUNTY TRAVEL DEMAND PROJECTIONS<sup>1</sup>**

	YEAR				% Change
	1987		2000		
TOTAL AUTOMOBILE OWNERSHIP	471,400 <sup>2</sup>		546,800		16.0%
TOTAL VEHICLE MILES OF TRAVEL	13,342,000		13,656,000 <sup>3</sup>		2.4%
TOTAL TRIPS	1,799,757	100.0%	2,110,088	100.0%	17.2%
Automobile	(1,748,521)	(97.2%)	(2,037,064)	(96.5%)	(16.5%)
Transit	(51,236)	(2.9%)	(73,024)	(3.5%)	(42.5%)
• WORK TRIPS	486,222	100.0%	557,949	100.0%	14.8%
Single Occupancy Automobile	(374,567)	(77.0%)	(422,682)	(75.8%)	(12.9%)
Carpool Automobile	(81,319)	(16.7%)	(90,160)	(16.2%)	(10.9%)
Public Transit	(30,336)	(6.2%)	(45,107)	(8.1%)	(48.7%)
• NON-WORK TRIPS	1,313,535	100.0%	1,552,139	100.0%	18.2%
Automobile	(1,292,635)	(98.4%)	(1,524,222)	(98.2%)	(17.9%)
Public Transit	(20,900)	(1.6%)	(27,917)	(1.8%)	(33.6%)

1. MTC, Congestion Management Program Databook #4: San Mateo County, 1991, pages 10-13.
2. Estimated 1990 automobile ownership within San Mateo County. MTC, Congestion Management Program Databook #4: San Mateo County, 1991.
3. Existing 1990 data, MTC, Regional Transportation Plan EIR, 1991, page 4.1.

were single-occupancy vehicles and 17 percent were carpool). Six percent of all work trips were by public transit.<sup>16</sup> Most transit work trips involved workers commuting from San Mateo County to downtown San Francisco.<sup>17</sup> For non-work trips, County residents used the automobile for over 98 percent of the time and transit for less than 2 percent of the time.

On-road vehicle emissions most significantly degrade local air resource quality, particularly near high volume or congested roadways. On-road vehicles emit more air pollutants when operating at speeds above or below 55 miles per hour (mph). On average, automobiles emit 5.1 grams of carbon monoxide per mile (gpm) when operated at 55 mph.<sup>18</sup> This is their most emission efficient speed. Above or below this speed, automobile emission rates increase significantly: at 65 mph they emit 22.3 gpm (330 percent increase); at 45 mph they emit 6.1 gpm (20 percent increase); at 35 mph they emit 7.7 gpm (51 percent increase); and at 25 they emit 11.0 gpm (115 percent increase). When many on-road vehicles are forced to operate at these less emission efficient speeds, particularly when they travel along high volume or congested roadways, their collective emissions can form "hot spots" within 3,200 feet of a freeway or within 1,600 feet of an arterial or intersection.<sup>19</sup> Figure 8 shows where vehicles traveling on the County's high volume or congested roadways are likely to create such hot spots.

The County's major employment centers are an important "indirect" source of mobile source emissions because they attract trips that congest surrounding roadways. A comparison between Figures 8 and 9 shows many of the County's congested roads are located near stationary "area" sources. The air pollution found near these roadways is in large part attributable to the person trips made by employees and shoppers travelling to and from these centers.

#### b. Stationary Sources

The County's stationary sources generate much less air pollution than mobile sources. Table 3 shows that in 1990, stationary sources emit about 23 percent of the County's total reactive hydrocarbons; 8 percent of its nitrogen oxides and sulfur dioxide; and about 6 percent of the carbon monoxide and suspended particulate matter. They emit about 40 percent of the County's TAC emissions and are responsible for all the County's odor complaints. Figure 7 shows most of the County's stationary sources shown in are located within the Bayshore Freeway (US 101) Corridor especially in the North County and the Mid-Bayside. They are less concentrated in the South Bayside and do not occur in the Coastside.

Stationary "area" sources contribute a small share of the emissions which degrade areawide air resources. "Area" sources include the County's major employment centers where many individually small air polluting processes (e.g., space heating) occur. In 1990, these areas included most of the 303,600 jobs supported by San Mateo County's economy.<sup>20</sup> Two-thirds of these jobs are in the County

non-manufacturing economic sector which includes service (not including automobile repair), wholesale and retail trades, and finance, insurance, and real estate (FIRE), and government jobs. It is expected that most of these jobs are located in the office buildings and shops found within the Bayshore Freeway Corridor.

Stationary "point" source emissions are significant because they increase the likelihood of hot spot formation and they are responsible for all of the County's odor complaints.<sup>21</sup> About 2,000 facilities within the County qualify as stationary "point" sources.<sup>22</sup> Almost all of these are located within the Bayshore Freeway Corridor and are associated with the County's manufacturing economic sector. They include automobile service, manufacturing, and transportation facilities, especially those facilities associated with air transportation. Employment at these facilities comprise one-third of the County's total jobs. These facilities house high emission activities such as fuel combustion, spray painting, and automobile repair. Figure 7 shows point sources that release enough emissions to increase the health risk potential for the nearby population.<sup>23</sup>

The County's agriculture and mining sector comprise a small part of the County's total employment and is generally not associated with significant "point" sources.

#### c. Other Sources

In general, "other" sources account for less emissions than either mobile or stationary sources. However, they do contribute almost all of the County's total suspended particulate matter (PM10) emissions. Other sources include accidental fires, construction sites, agricultural activities, off-road equipment, and road dust generated by moving vehicles. Of the County total emissions, these sources generate 88 percent of the PM10 emissions, 24 percent of reactive hydrocarbons, and less than 1 percent of the carbon monoxide, nitrogen oxides, and sulfur dioxides. These sources generate an insignificant amount of TAC and they are not a common source of odorous substances. Road dust disturbed by on-road vehicles account for almost all of the PM10 generated by the "other" source category and most of the County's total PM10 emissions. Most of the reactive hydrocarbon emissions are generated by diesel construction and off-road equipment. Emissions from these sources occur throughout in the County's urban area where almost all of the automobile travel, construction and employment are concentrated within the County.

PM10 emissions attributable to road dust significantly degrade the County's areawide and local air resource quality while construction and off-road equipment can generate enough reactive hydrocarbon and PM10 emissions to degrade local air resource quality. Road dust accounts for about 60 percent of the County's total PM10 emissions and significantly degrades areawide air resource quality.<sup>24</sup> This PM10 source is attributed to the vehicle travel within the County



where residents amassed about 13 million vehicle miles of travel in 1990. Once PM10 becomes airborne, it is distributed by winds throughout the County's urban area where it degrades areawide air resource quality. On warm and calm days, PM10 emissions from roads, construction sites, and agricultural activity (e.g., tilling) can concentrate enough to degrade local air resource quality. Under these same conditions, reactive hydrocarbon emissions from construction sites and off-road equipment can contribute to the degradation of local air resource quality as well.

### C. EXISTING PUBLIC HEALTH EXPOSURE

Air pollutant concentrations exceeding State and federal ambient air quality standards are known to have adverse health effects. The general population will usually experience transitory health effects when exposed to high air pollutant concentrations for prolonged periods. These health effects include eye and respiratory tract irritation, headaches, coughing and chest pains, unpleasant odors, and impaired visibility. Children, the elderly, and the chronically or acutely ill are most susceptible to high air pollution concentrations. Because of this sensitivity, they are collectively referred to as "sensitive receptors." The ailments that are likely to occur in this group include bronchitis, emphysema, asthma, and restrictive ventilatory disease.

Table 2 lists health effects associated with air pollution concentrations above State and federal standards. Figures 7 and 8 show where these high concentrations, or hot spots, may occur and threaten the health of the general population, including sensitive receptors.

#### 1. Carbon Monoxide

Carbon monoxide is a localized rather than an areawide public health threat because of its tendency to concentrate near its emission source. Consequently, carbon monoxide emissions from mobile sources pose the most significant public health threat during calm autumn or winter nights, especially to persons located in urban areas where mobile sources are concentrated on high volume, congested roadways. Approximately 90,000 persons are located near these roadways and are exposed to high localized carbon monoxide concentrations, found in the South Bayside and Mid-Bayside. In general, persons located within low and medium pollution potential areas elsewhere in the County are not exposed to high localized carbon monoxide concentrations for prolonged periods.

#### 2. Ozone

Ozone is an areawide public health threat that affects the County and the Bay Area. Although future ozone violations are not expected in San Mateo County, the population within bayside communities will be subject to ozone levels near State standards during warm summer days. Approximately 500,000 persons are located within the bayside communities where ozone levels occur on during warm summer days.



3. Suspended Particulate Matter

Suspended Particulate Matter (PM10) also poses an areawide public health threat, especially to persons located in the bayside communities of San Mateo County. Approximately 500,000 persons in San Mateo County are subject to concentrations above State and federal ambient PM10 standards during calm days.

4. Toxic Air Contaminants (TAC)

TAC emissions become a local public health threat when they are concentrated enough to form a "hot spot" in a populated area. Generally, TAC emissions from stationary "point" sources located within or adjacent to residential areas are most likely to create a significant public health threat. In 1992, BAAQMD identified 9 such sources within the County.<sup>25</sup> The most significant of these was a Mid-Bayside dry cleaning business located near a residential area. The other eight sources were located in other bayside locations and emit limited amounts of TAC's which do not pose a public health risk.

5. Other Air Pollutants

Existing public health exposure to other air pollutants including sulfur dioxide, odorous substances, sulfates, lead, hydrogen sulfide and vinyl chloride is not significant.

### III. DESCRIPTION OF PROJECTED AIR RESOURCE CONDITIONS

#### A. PROJECTED AMBIENT AIR QUALITY

With the exception of PM<sub>10</sub>, BAAQMD projects San Mateo County's areawide air resource quality will continue to meet State and federal ambient air pollution standards because the County's total emissions will decrease. The Bay Area, however, will continue to record carbon monoxide, ozone and PM<sub>10</sub> violations of the State standards, but fully attain the federal standards by mid-1990.<sup>26</sup>

Local air resource quality within the County's urban areas will, however, be subject to high air pollution concentrations, or "hot spots." The potential for hot spot formation will be greatest in the North County, Mid-Bayside and South Bayside where emission sources are concentrated, particularly along high volume and congested roadways.

Table 6 lists the amount of pollutants San Mateo County sources are projected to emit in 2000. This table also shows the difference in emission levels between 1990 and 2000. Anticipated San Mateo County 1990-2010 emission trends are illustrated in Figure 9.

##### 1. Carbon Monoxide

Projected ambient carbon monoxide concentrations in San Mateo County are not expected to violate State or federal standards. The Bay Area, however, is expected to continue to violate State carbon monoxide standards.

Between 1990 and 2000, carbon monoxide emissions within the County will fall by 30 percent and by another 11 percent in 2010. Most of this improvement is attributable to more stringent automobile exhaust standards and the increased use of automobiles with catalytic converters.<sup>27</sup> However, the proposed San Francisco International Airport Expansion Project may reduce anticipated Countywide CO reductions, because it will increase CO emissions associated with aircraft operations by 126 percent between 1990 and 2006.<sup>28</sup>

##### 2. Ozone and Ozone Precursors

Projected ambient ozone concentrations in San Mateo County are not expected to violate State or federal standards. The Bay Area, however, is expected to continue to violate State ozone standards.

Figure 9 shows the amount of ozone precursor emissions are projected to decrease by 2000 and rise again by 2010. Table 6 shows that, by 2000, reactive hydrocarbon will decrease by 16 percent and nitrogen oxides will decrease by 21 percent. This reduction is primarily due to reduced on-road vehicle emissions brought about by cleaner burning fuels and increased vehicle fuel efficiency. However, ozone precursor emissions are expected to rise between 2000 and 2010 due to increased stationary source emissions related to the County's projected economic expansion. By 2010, the overall reactive hydrocarbon and nitrogen oxides reduction

from 1990 levels would be 14 and 13 percent, respectively. The emissions may actually increase further if the proposed San Francisco International Airport expansion occurs, because emissions generated by additional aircraft operations at the airport is anticipated to increase by 60 percent between 1990 and 2006.<sup>29</sup>

3. Suspended Particulate Matter (PM10)

Projected ambient PM10 concentrations within San Mateo County is expected to violate State standards in the future.

Table 6 shows PM10 emissions will increase by 17 percent between 1990 and 2000. Figure 9 shows this trend will continue between 2000 and 2010 when PM10 emissions are expected to increase another 5 percent. This increase will be experienced throughout the Bay Area and is primarily due to additional road dust generated by an increase in the number of trips and the vehicle miles of travel.

4. Nitrogen Dioxide

Projected ambient nitrogen dioxide concentrations within San Mateo County and the Bay Area are not expected to exceed State or federal air quality standards in the future.

Projected nitrogen dioxide emissions from mobile sources will be reduced at about the same levels as nitrogen oxides (16 percent between 1990 and 2000, and 14 percent between 1990 and 2010). This reduction is also the result of cleaner burning fuels and increased vehicle fuel efficiency. Projected emissions from stationary or other sources are not expected to increase significantly in the future. This is due to the use of more effective emission control device by stationary sources and the limited number of sites in San Mateo County for new industrial or commercial facilities.

5. Sulfur Dioxide

Projected ambient sulfur dioxide concentrations within San Mateo County and the Bay Area are expected to parallel reduced ambient nitrogen dioxide concentrations and not exceed State or federal air quality standards in the future.

Projected sulfur dioxide emissions from mobile sources will be reduced by about 28 percent by 2000 as a result of cleaner burning fuels and increased vehicle fuel efficiency. However, emissions from stationary sources are projected to increase slightly between 2000 and 2010 which will result in a 23 percent overall reduction between 1990 and 2010. Like nitrogen dioxide, this trend is due to the use of more effective emission control devices by stationary sources and the limited number of sites in San Mateo County where new industrial or commercial facilities may be developed.



6. Toxic Air Contaminants (TAC)

Future ambient TAC concentrations within San Mateo County and the Bay Area are expected to be at or below the current measured levels. BAAQMD's regulations, cleaner burning fuels and improved emission control devices should reduce TAC emissions from stationary "point" sources by 50 percent by 1995.<sup>30</sup> Reduced TAC emissions from mobile sources should also occur due to increased fuel efficiency, more stringent exhaust emission standards, and oxygenated fuels. However, the actual amount reduced has not been projected by BAAQMD and cannot be determined.<sup>31</sup>

7. Odorous Substances

BAAQMD does not project emission of odorous substances. The potential for release of volatile organic compounds and other odorous substances will be minimized by improved stationary source emission control devices and operating/handling procedures. However, if future residential development occurs on undeveloped sites near established industrial or commercial areas, the potential for odor complaints may remain the same or increase.

8. Other Air Pollutants

Projected ambient concentrations of the other air pollutants including sulfates, lead, hydrogen sulfide and vinyl chloride are expected to be below State and federal standards within the County and the Bay Area. BAAQMD does not estimate future emission sources for these pollutants.

B. PROJECTED AIR POLLUTION POTENTIAL

Although areawide air quality will be improved by 2000, local air quality will continue to be degraded by air pollution hot spots that form at County locations where calm climatic conditions are found and where emission sources are concentrated. In particular, locations adjacent to high volume or congested roadways or near major employment centers in the North County, Mid-Bayside and South Bayside will be subject to hot spot formation when local winds are not strong. Air pollution hot spots are less likely to degrade local air resource quality at other locations within the County, particularly in the Coastside and parts of the North County where strong winds prevail and where emission sources are not concentrated.

1. Local Climatic Conditions and Topography

Projected climatic conditions and topography are expected to remain unchanged in the long term. However, in the short term, variation will occur. Few storms and limited cloud cover during a drought may increase the frequency and duration of surface and temperature inversions, thereby allowing unhealthy concentrations of carbon monoxide and ozone to form. Also, several years of drought increase the potential for topsoil wind erosion, increasing ambient PM10 concentrations in the atmosphere.



## 2. Emission Sources

Projected San Mateo County source emissions in 2000 are listed in Table 5 and are based projected San Mateo County household, employment, land use and travel demand. Projected emissions do not include anticipated reductions from additional emission source and transportation control measures included in the San Mateo County TSM, the BAAQMD '91 CAP, or the MTC Regional Transportation Plan. Nor does it include the emissions generated by additional on-road vehicle and aircraft operations that would occur if the proposed San Francisco International Airport Master Plan is implemented. It does, however, include reductions from on-going State programs which require more stringent automobile emission control standards, increased automobile fuel efficiency, and the use of cleaner burning fuels.

### a. Mobile Sources

Mobile sources will continue to be the most significant source of the County's total emissions because of extensive automobile use and economic growth within the County. However, the amount of emissions generated by mobile sources will be less than in 1990 because of improved emission control technology and cleaner burning fuels. Table 6 shows that mobile sources will continue to generate a large percentage of the County's projected total emissions, including 89 percent of carbon monoxide, 88 percent of nitrogen oxides, and 41 percent of reactive hydrocarbons. This table also shows that mobile source emissions will reduce from 1990 levels by 40 percent for carbon monoxide, 24 percent for nitrogen oxides, and 43 percent for hydrocarbons. While the amount of TAC emissions generated by mobile sources in 2000 is not known, it is expected that they will reduce from 1990 levels by about 40 percent (the same rate as reactive hydrocarbon). Mobile source emissions will continue to be concentrated along portions of the Bayshore Freeway (101), Junipero Serra Freeway (280) and Interstate 380 while they are projected to increase along Woodside Road (84) and decrease along Highway 92.

On-road vehicles are projected to continue as the most significant source of mobile source emissions, and a large part of the County's total emissions. In 2000, on-road vehicle emissions will constitute 56 percent of the County total carbon monoxide, 48 percent for nitrogen oxides, and 14 percent for hydrocarbon. However, the amount of air pollutants emitted by on-road vehicles will be roughly 50 percent less than in 1990.<sup>32</sup> These reductions are anticipated because of more stringent vehicle emission controls, improved vehicle fuel efficiency requirements and the use of cleaner burning fuel.

Mobile source emission reductions will occur despite the increased number of on-road vehicles operating on the County roadways forecast by MTC. San Mateo County travel demand forecasts for 2000, shown in Table 6, anticipates that County residents will own 546,800 automobiles (+16 percent).<sup>33</sup> They are expected to make 2.1 million person trips (+17 percent), and amass 13.3 million vehicle miles

TABLE 6

SAN MATEO COUNTY 2000 AIR POLLUTANT EMISSIONS (TONS PER DAY)

PROJECTED 2000 EMISSIONS	OZONE PRECURSORS						SUSPENDED PARTICULATE MATTER		SULFUR DIOXIDE	
	CARBON MONOXIDE		REACTIVE HYDROCARBONS		NITROGEN OXIDES					
Mobile Sources	189.54	88.8%	25.44	40.6%	41.98	88.4%	6.11	4.7%	2.76	87.1%
On-Road	(118.81)	(55.7%)	(15.16)	(24.2%)	(22.93)	(48.3%)	(5.51)	(4.2%)	(1.42)	(44.8%)
Off-Road	(50.10)	(23.4%)	(4.82)	(7.7%)	(9.16)	(19.3%)	(0.59)	(0.5%)	(1.31)	(41.3%)
Aircraft	(20.72)	(9.7%)	(5.46)	(8.7%)	(9.89)	(20.8%)	(0.01)	(0.0%)	(0.03)	(0.9%)
Stationary Sources	23.02	10.8%	17.78	28.3%	5.49	11.6%	8.04	6.2%	0.41	12.9%
Point	(1.11)	(0.5%)	(4.90)	(6.5%)	(1.03)	(2.2%)	(2.17)	(1.7%)	(0.24)	(7.6%)
Area	(21.91)	(10.3%)	(13.69)	(21.8%)	(4.46)	(9.4%)	(5.87)	(4.5%)	(0.17)	(5.4%)
Other Sources	0.91	0.4%	19.50	31.1%	0.02	0.0%	116.37	89.2%	0.00	0.0%
TOTALS	213.47	100%	62.72	100%	47.49	100%	130.52	100%	3.17	100%

TABLE 6 (continued)

DIFFERENCE BETWEEN SAN MATEO COUNTY 1990 AND 2000 EMISSIONS (TONS PER DAY)

	<u>OZONE PRECURSORS</u>						<u>SUSPENDED PARTICULATE MATTER</u>		<u>SULFUR DIOXIDE</u>	
	<u>CARBON MONOXIDE</u>		<u>REACTIVE HYDROCARBONS</u>		<u>NITROGEN OXIDES</u>					
Mobile Sources	-92.45	-32.8%	-11.46	-31.1%	-9.87	-23.7%	-0.32	-5.0%	-1.26	-31.3%
On-Road	(-102.54)	(-46.3%)	(-12.42)	(-45.0%)	(-12.95)	(-42.6%)	(-0.40)	(-6.8%)	(1.46)	(-50.7%)
Off-Road	(6.66)	(15.4%)	(0.06)	(1.3%)	(1.44)	(24.1%)	(0.08)	(15.7%)	(0.20)	(18.0%)
Aircraft	(3.43)	(19.8%)	(0.90)	(19.7%)	(1.64)	(27.9%)	(0.00)	(0.0%)	(0.00)	0.0%
Stationary Sources	1.42	6.6%	0.51	3.0%	0.53	14.4%	1.00	14.2%	0.05	13.9%
Point	(0.07)	(6.6%)	(0.12)	(3.0%)	(0.10)	(14.4%)	(0.27)	(14.2%)	(0.03)	(13.9%)
Area	(1.35)	(6.6%)	(0.39)	(3.0%)	(0.43)	(14.4%)	(0.73)	(14.2%)	(0.02)	(13.9%)
Other Sources	0.07	8.3%	-0.63	-3.1%	0.00	0.0%	18.01	18.3%	0.00	0.0%
TOTALS	-90.96	-29.9%	-11.58	-15.6%	-9.34	-20.7%	18.69	16.7%	-1.21	-27.6%



of travel (+2 percent).<sup>34</sup> Of the total trips, 26 percent are projected to be work trips and 73 percent non-work trips--virtually the same as in 1987. It is expected that about 92 percent of all work trips will involve the automobile (76 percent involving single-occupancy vehicles and 16 percent on carpools) and 8 percent will involve public transit. Although this is about the same as 1987 levels, transit work trips increased 49 percent due to expanded CalTrain and BART service within the County.<sup>35</sup> For non-work trips, County residents are projected to use the automobile 98 percent of the time and transit 2 percent of the time--the same as in 1987.

The MTC forecast does not include anticipated changes in travel demand caused by the County TSM and Plan and the BAAQMD Clean Air Plan's transportation control measures.

On-road vehicle emissions will continue to degrade local air resource quality near the County's high volume and congested roadways. Despite improved emission controls, on-road vehicles will continue to emit more emissions when they are forced to lower speeds. These emissions cause hot spots near roadways which carry high traffic volumes or which are subject to congestion. MTC forecasts that, by 2000, travel on the County's arterial during the AM peak hour will increase by almost 12 percent when freeway travel will remain the same.<sup>36</sup> These hot spot are likely to occur near the County's high volume and congested roadways.

Major employment centers will continue to be important "indirect" sources of mobile source emissions because they attract trips that congest surrounding roadways. It is anticipated that job increases related to projected economic growth will occur in the County's major employment centers. MTC projects an 18 and 22 percent increase in trip destination to places of employment and shopping, which include major employment centers.

b. Stationary Source

Air pollutants emitted by stationary sources are projected to increase slightly above 1990 levels. Table 6 shows that stationary sources are expected to emit 6.6 percent more carbon monoxide, 3 percent more reactive hydrocarbon, 10.7 percent more nitrogen oxide, 14.2 percent more PM10, and 13.9 percent more sulfur dioxide. This increase is primarily due to the County's expanding economy which will add 19 percent more jobs by 2000.<sup>37</sup> Most of these new jobs are in the non-manufacturing sector and are associated with low emission activities. This table shows that, compared with 1990 levels, stationary source emissions for most pollutants will constitute a larger share of the County total emissions because of the dramatic reduction in mobile source emissions. Stationary sources will continue to be located in the County's urban areas, particularly within the Bayshore Freeway Corridor.



With the exception of reactive hydrocarbon emissions, Table 6 shows that stationary "area" sources will emit less than 11 percent of the County's total projected pollutants. It is expected that most of the County's stationary "area" source emissions will be generated by the County's major employment centers. Expansion within these centers is expected to reflect the County's economic growth and may induce further construction on the County's vacant or under-utilized land. It is anticipated this type of development would expand existing stationary "area" sources from 8,600 acres in 1990 to 9,500 acres by 2000, a 10 percent increase.<sup>38</sup> ABAG's projections indicate the North County, particularly near the San Francisco International Airport, will experience most of the County's economic growth.<sup>39</sup>

The amount of stationary "point" sources emissions will remain relatively unchanged at or below 10 percent of the County's total emissions. Although, future "point" source emissions cannot be estimated, jobs in the air transportation sector are projected by the California Economic Development Department to increase by 16 percent between 1989 and 1996.<sup>40</sup> This indicates that a high potential for new "point" sources in the San Francisco International Airport area where high emission activities (e.g., solvent use, fuel storage and handling, spray painting, cleaning) already occur.

c. Other Sources

In 2000, "other" sources (e.g., accidental fires, construction, agriculture, off-road equipment, and road dust) will continue to generate most of the County's PM10 emissions and, as a result, degrade areawide air resource quality. Table 6 shows that, of the County's projected total emissions, "other" sources will generate almost all the PM10 (89 percent), one-third the reactive hydrocarbons (31 percent), and less than 1 percent of the total carbon monoxide, nitrogen oxides and sulfur dioxides emissions. Overall, PM10 emission levels will increase 17 percent above 1990 levels. This increase is almost entirely attributable to road dust generated by increased person trips (+17 percent) and vehicle miles of travel (+2 percent) within the County. The increased PM10 emissions will be felt most in the County's urban areas where ambient concentrations currently exceed State and federal standards. The amount of reactive hydrocarbon emissions from construction, agriculture and off-road equipment will remain about the same as the 1990 levels.

C. PROJECTED PUBLIC HEALTH EXPOSURE

The County's general public will continue to experience health problems due to degraded local air resource conditions when they are located in areas where the potential for hot spot formation is high. The County's sensitive receptors are especially vulnerable to health problems in these areas. Elsewhere in the County, the general public and sensitive receptors will benefit from improved areawide air resource conditions.

1. Carbon Monoxide

Despite general improvement in areawide air resource quality in the County and the Bay Area, persons located near high volume and congested roads in high air pollution potential areas will continue to be exposed to health risks associated with high localized carbon monoxide concentrations on calm autumn and winter nights. Approximately 101,000 persons located within high pollution potential areas of the South Bayside and Mid-Bayside will be exposed to harmful carbon monoxide concentration levels near high volume, congested roadways.

2. Ozone

Despite projected ambient ozone concentration and ozone precursor emissions reductions in San Mateo County and the Bay Area, County residents living in urban areas will continue to be exposed to ozone related health risks during calm, warm summer days. On these days, about 500,000 persons in the County's bayside communities will continue to be exposed to ozone concentrations near State standards.

3. Total Suspended Particulates (PM10)

Projected PM10 emissions within the County and the Bay Area indicate that ambient PM10 concentrations will continue to pose an areawide public health threat during calm days. Approximately 500,000 persons in San Mateo County will be subject to concentrations above State and federal ambient standards during these periods.

#### IV. EXISTING PLANS, POLICIES, AND REGULATIONS AFFECTING AIR QUALITY

State and federal air pollution regulations establish ambient air quality standards that limit the concentration of pollutants in the air people breathe while regional and local plans include policies or regulations that limit activities that emit criteria pollutants or reduce public exposure to air pollution.

##### A. FEDERAL, STATE AND REGIONAL

##### 1. Federal Plans, Policies and Regulations

###### a. Federal Clean Air Act Amendment (1990)

National ambient air quality regulations were first established in 1970 by the Federal Clean Air Act for six pollutants: carbon monoxide, ozone, total suspended particulates (PM10), nitrogen dioxide, sulphur dioxide and lead. These pollutants are commonly referred to as "criteria" pollutants, because they are measured to determine State compliance with federal air quality standards. The Act required states exceeding these standards to prepare air quality plans showing how the standards would be met by December, 1987. The Act was amended in 1977, and again in 1990, to extend the deadline to 1994, and to direct the Environmental Protection Agency (EPA) to assist states that have not attained the national standards. These states, including California, are required to prepare revised State Implementation Plans (SIP) that outline how they will achieve federally mandated air quality standards. Failure to submit a plan or secure approval from the EPA could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants.

Because many California metropolitan regions like the Bay Area will not attain the federal carbon monoxide and ozone standards, the State must submit a revised SIP to the EPA. This plan will incorporate the revised federal Bay Area Air Quality Plan (1982) to show how federal air quality standards will be attained in the Bay Area. MTC, ABAG and the BAAQMD are responsible for revising this air quality plan. CARB is responsible for incorporating it in the revised California SIP and then submitting it the EPA for approval.

##### 2. State Plans, Policies and Regulations

###### a. California Clean Air Act (1988)

The 1988 California Clean Air Act (CCAA) established State ambient air quality standards more stringent than the federal standards. In addition to the six criteria pollutants regulated by the federal Clean Air Act, CCAA establishes standards for three more pollutants: Hydrogen Sulphide, Sulfates, and Vinyl Chloride. In general, this Act requires regions like the Bay Area, which exceed state air quality standards, to (1) reduce harmful pollutants by 5 percent or more per year, and (2) to meet the State air quality standards as



expeditiously as possible. The California Air Resources Board (CARB) implements the CCAA requirements by requiring regional air quality districts, like the Bay Area Air Quality Management District (BAAQMD), to prepare Clean Air Plans and by implementing a number of Statewide automobile emission control regulations and "Smog Check" programs.

b. Toxic "Hot Spots" Information and Assessment Act (1987)

The Toxic "Hot Spots" Information and Assessment Act was enacted by California Legislature to identify toxic air contaminant hot spots that may pose a public health threat.<sup>41</sup> The State Department of Health Services and the Air Resources Board work together to administer Statewide implementation of this Act. They require regional air quality districts, including BAAQMD, to: (1) develop controls which limit toxic emissions from specific industries; (2) prepare an annual toxic emission inventory; (3) review new development for potential public health threats; and (4) measure actual toxic air contaminant concentrations. This act requires that businesses and other establishments, identified as a source of toxic emissions, notify the affected population and provide them with information about health risks posed by the emissions.

c. State Motor Vehicle Emission Control Program

The California Air Resources Board (CARB) regulates the amount of pollutants new motor vehicles sold in California may emit. Motor vehicle emission standards have become increasingly stringent since they were first imposed in 1961 by the State Motor Vehicle Pollution Control Board (i.e., CARB's predecessor). They are more stringent than the federal automobile emission control standards that apply in the nation's other states. CARB requires all automobile manufacturers selling vehicles in California to: (1) design fuel efficient vehicles, and (2) install and test emission control devices. These requirements apply to gasoline powered passenger vehicles and are intended to reduce their carbon monoxide, reactive hydrocarbon, and nitrogen oxide emissions. This requirement does not apply to diesel-powered vehicles which generally includes buses, heavy-duty trucks, trains, and boats. CARB is working on new requirements to reduce motor vehicle Toxic Air Contaminant (TAC) emission. CARB also administers the vehicle inspection and maintenance program (I/M or Smog Check Program) as required by the federal Clean Air Act amendment.

3. Regional Plans, Policies and Regulations

a. Bay Area Air Quality Plan (1982)

The federal Clean Air Act (1970; 1977) required MTC, ABAG and the BAAQMD to prepare the first Bay Area Air Quality Plan in 1979 and then amend it in 1982. Its primary objective was to attain federal air quality standards by 1987. The 1982 Clean Air Plan requires that: (1) Bay Area's major stationary point sources to retrofit emission control devices, (2) new sources apply for air quality permits, (3) registered Bay Area vehicles pass a vehicle inspection

and maintenance program (e.g., "Smog Check") every two years, (4) 12 federal transportation control measures be implemented, and (5) MTC assess the conformity of regional plans, programs and projects with air quality objectives.

Although these requirements resulted in significant air quality improvement, the Bay Area failed to attain federal air quality standards for carbon monoxide, ozone, and suspended particulate matter by 1987. In 1989, MTC implemented a contingency plan to demonstrate that the Bay Area was making all reasonable further progress to attain federal air quality standards. It included (1) 16 additional transportation control measures, (2) an annual centralized vehicle inspection and maintenance program, (3) a requirement to sell oxygenated fuels during the winter months, and (4) a revised "conformity" assessment procedure.

The 1982 plan is the federal air quality plan for the Bay Area until it is revised to incorporate additional 1990 Federal Clean Air Act Amendment requirements. MTC, BAAQMD, and ABAG are required to revise this plan by 1993. It must include: (1) new procedures for assessing conformity of regional plans, programs and projects with air quality objectives; (2) a plan how volatile organic compounds will be reduced by 15 percent by 1996; and (3) a plan as to how the State will achieve annual reduction necessary to meet the federal ozone standard by 1996.

b. Bay Area Clean Air Plan (1991)

The California Clean Air Act (1988) requires that BAAQMD prepare a Clean Air Plan (CAP). The Bay Area's 1990 air pollution violations classify it as a "severe" air basin and, as a consequence, the CAP must show how BAAQMD will attain State carbon monoxide and ozone standards by the earliest practicable date. The plan must include: (1) additional control measures on existing stationary sources; (2) a permitting program that will result in no net increase in emissions from new stationary sources; (3) provisions for indirect source controls; and (4) State transportation control measures.

The CAP sets forth BAAQMD's strategy to implement all feasible measures to attain State air quality standards by 1997. It relies on a number of mobile source and stationary source control measures that it will implement in the County and the Bay Area. The prime objective of mobile source control measures is to reduce vehicle trips and vehicle miles traveled within the region. These measures are shown in Table 7 and are categorized by the following activities: (1) employer-based trip reduction, (2) mobility improvements, (3) implementation support, (4) traffic operation management, (4) user incentives, (5) indirect source review measures, and (6) pricing strategies. BAAQMD will strive to reduce emissions by implementing new, as well as traditional, stationary source control measures. Generally, these measures require "best available control technologies that limit emissions to the maximum degree possible.

**TABLE 7**  
**TRANSPORTATION CONTROL MEASURE LISTING**

Federal Air Quality Plan

Original (1982 Plan)		Contingency Plan (February, 1990)		State Clean Air Plan	
<u>FTCM 1</u>	- Reaffirm Commitment to 28% Transit Ridership Increase Between 1978 and 1983	<u>FTCM 13</u>	- Increase Bridge Tolls to \$1.00 on all Bridges	<u>STCM 1*</u>	- Expand Employer Assistance Program
<u>FTCM 2</u>	- Support Post-1983 Improvements in the Operators' 5-Year Plans and, After Consultation with the Operators, Adopt Ridership Increase Target for the Period 1983 through 1987	<u>FTCM 14</u>	- Bay Bridge Surcharge of \$1.00	<u>STCM 2*</u>	- Adopt Employer-Based Trip Reduction Rule
		<u>FTCM 15</u>	- Increase State Gas Tax by 9 Cents	<u>STCM 3</u>	- Improve Areawide Transit Service (FTCM 17, FTCM 19)
		<u>FTCM 16</u>	- Implement MTC Resolution 1876, Revised New Rail Starts	<u>STCM 4</u>	- Expedite and Expand Regional Rail Agreement (FTCM 16)
<u>FTCM 3</u>	- Seek to Expand and Improve Public Transit Beyond Committed Levels	<u>FTCM 17</u>	- Continue Post-Earthquake Transit Services	<u>STCM 5</u>	- Improve Access to Rail
		<u>FTCM 18</u>	- Sacramento-Bay Area Amtrak Service	<u>STCM 6</u>	- Improve Intercity Rail Service (FTCM 18)
<u>FTCM 4</u>	- High Occupancy Vehicle (HOV) Lanes and Ramp Metering	<u>FTCM 19</u>	- Upgrade CalTrain Service	<u>STCM 7</u>	- Improve Ferry Service (FTCM 17)
<u>FTCM 5</u>	- Support Rides Efforts	<u>FTCM 20</u>	- Regional HOV System Plan	<u>STCM 8</u>	- Construct Carpool/Express Bus Lanes on Freeways (FTCM 4, FTCM 20)
<u>FTCM 6</u>	- Continue Efforts to Obtain Funding to support Long Range Transit Improvements	<u>FTCM 21</u>	- Regional Transit Coordination	<u>STCM 9</u>	- Improve Bicycle Access
		<u>FTCM 22</u>	- Expand Regional Transit Connection Ticket Distribution	<u>STCM 10</u>	- Youth Transportation
<u>FTCM 7</u>	- Preferential Parking	<u>FTCM 23</u>	- Employer Audits	<u>STCM 11</u>	- Install Freeway Traffic Operation [TOS] (FTCM 26)
<u>FTCM 8</u>	- Shared Use Park and Ride Lots	<u>FTCM 24</u>	- Expand Signal Timing Program to New Cities		
<u>FTCM 9</u>	- Expand Commute Alternatives Program				



TABLE 7 (continued)

Federal Air Quality Plan

Original (1982 Plan)		Contingency Plan (February, 1990)		State Clean Air Plan	
<u>FTCM 10</u>	- Information Program for Local Governments	<u>FTCM 25</u>	- Maintain Existing Signal Timing Programs	<u>STCM 12</u>	- Improve Arterial Traffic Management (FTCM 24, 25)
<u>FTCM 11</u>	- Gasoline Conservation Awareness Program (GasCAP)	<u>FTCM 26</u>	- Incident Management on Bay Area Freeways	<u>STCM 13</u>	- Reduce Transit (FTCM 21)
<u>FTCM 12</u>	- Santa Clara County Commuter Transportation Program	<u>FTCM 27</u>	- Update MTC Guidance on Development of Local TSM Programs	<u>STCM 14</u>	- Vanpool Liability Insurance
		<u>FTCM 28</u>	- Local Transportation Systems Management (TSM) Initiatives	<u>STCM 15</u>	- Provide Carpool Incentives
				<u>STCM 16*</u>	- Indirect Source Control Program
				<u>STCM 17*</u>	- Public Education
				<u>STCM 18*</u>	- Zoning for Higher Densities Around Transit Stations
				<u>STCM 19*</u>	- Air Quality Element for General Plans
				<u>STCM 20</u>	- Conduct Demonstration Projects
				<u>STCM 21*</u>	- Implement Revenue Measures
				<u>Market Based Contingency Measures</u>	
				- Smog Free	
				- Gas Tax Increase	
				- Congestion Pricing	
				- Toll Road	
				- Parking Fees	
				(FTCM) - indicates federal TCM included in State TCM	
				* Defined by Bay Area Air Quality Management District to be Reasonably Available Measures	

They include controls on: (1) surface coating and solvent use, (2) fuels/organic liquids storage and distribution, (3) refinery and chemical processes, (4) combustion of fuels, and (5) other industrial/commercial processes.

c. Odorous Substance Control Program

The BAAQMD has enacted the Odorous Substance Control Program as part of its effort to control the use and emission of odorous substances within the Bay Area. This program places general limitations on odorous substances and provides the District with authority to respond to public complaints about offensive odors.

d. Regional Transportation Plan (1991)

The Metropolitan Transportation Commission's (MTC) Regional Transportation Plan (RTP) guides Bay Area transportation system improvement projects and shows how they will help attain regional air quality objectives in both the federal Clean Air Act Amendment and the California Clean Air Act. The Plan promotes projects that will (1) provide reasonable and predictable mobility within the region, (2) ensure all people have equitable access to transportation, (3) support healthy environment and mitigate any adverse effects, and (4) promote economic vitality within the region. The Plan identifies and evaluates the Bay Area Metropolitan Transportation System (MTS), a network of regionally significant streets and highways, transit systems and intermodal transfer facilities, and recommends projects that will improve its performance. Many of these recommendations implement federal and state TCMs listed in Table 7. This plan is revised annually to reflect changing transportation conditions.

The 1991 RTP key recommendations in San Mateo County are to (1) reduce congestion along portions of US 101 and HWY 92 and on the Hayward-San Mateo Bridge by increasing roadway capacity, (2) improve Dumbarton Bridge access by extending Bayfront Freeway (Highway 84) to Woodside Road, (3) increase rail transit access by expanding feeder bus to CalTrain stations, (4) increase CalTrain commute ridership by replacing downtown express-bus service with increased CalTrain service, (5) increase regional transit airport access by extending BART to SFO, and (6) improve regional rail service by extending CalTrain to 2nd and Market or to the Transbay Terminal in San Francisco.

B. COUNTYWIDE PLANS AND REGULATIONS

1. San Mateo County Congestion Management Program

The purpose of the Congestion Management Program (CMP) is to: (1) establish a political process public agencies can use to alleviate or control Countywide roadway congestion, (2) assure public agencies develop a comprehensive strategy to respond to Countywide transportation

needs, and (3) make public agencies eligible to receive Flexible Congestion Relief funds.<sup>42</sup> State law requires that each county establish a Congestion Management Agency (CMA) prepare, implement and annually update the CMP. The City/County Association of Governments of San Mateo County (C/CAG) is designated as the County's CMA. The CMP consists of the following basic elements: (1) CMP Network that includes State highways and selected arterials, (2) traffic level of service (LOS) standards for segments on the CMP Network, (3) transit LOS standards for County's bus, rail, and other transit systems, (4) a travel demand program to promote travel by alternative transportation modes (non-single-occupancy vehicle), (5) a land use impact analysis program to evaluate land use development impacts on the CMP Network and air quality, and (6) a seven-year Capital Improvement Program (CIP) to fund transportation projects that support CMP goals. The CMP must be updated annually to reflect changing transportation needs and conditions within the County. The CMP CIP must be submitted to MTC every two years to be incorporated into the Bay Area Regional Transportation Improvement Program.

## 2. AB 434 (Transportation Fund for Clean Air)

Assembly Bill 434 (Sher, 1991) established a vehicle registration surcharge to fund specified transportation control measures (TCMs). This bill gave the BAAQMD the authority to impose a surcharge on motor vehicle registrations within the Bay Area to pay for programs that reduce mobile source emissions.<sup>43</sup> Currently, a \$4.00 surcharge is collected by DMV and is distributed to Bay Area public agencies each year. BAAQMD estimates these fees will generate approximately \$17 million per year.<sup>44</sup> The BAAQMD directly allocates 40 percent of the funds to County Program Managers who then distribute the funds to agencies sponsoring projects that provide local benefit within the County. The designated AB 434 Program Manager in San Mateo County is the City/County Association of Governments (C/CAG). BAAQMD then allocates the remaining 60 percent regionwide to public agencies sponsoring the most cost-effective projects.

Only specified TCMs are eligible for AB 434 funds. They include:<sup>45</sup> (1) ridesharing/trip reduction ordinances/programs (CAP TCMs 1 and 2), (2) clean fuel buses for schools and transit operators (CAP TCMs 3 and 10), (3) feeder bus/shuttle service to transit stations (CAP TCM 5), (4) local arterial traffic management (CAP TCM 12), (5) rail-bus integration/regional transit information (parts of CAP TCM 13), (5) telecommuting, congestion pricing, public transit and alternative fuel vehicle demonstration projects (CAP TCM 20), and (6) smoking vehicle program (CAP Control Measure H1). The programs and projects are selected based on an open-ended, competitive review process that primarily rewards cost-effective emission reduction measures.<sup>46</sup> It also rewards measures that are supported by matching funds, creative, implement Federal TCMs, based on public/private partnerships, show a clean air planning commitment, and induce a mode and/or fuel shift.



3. San Mateo County Sales Tax Expenditure Plan

In 1988, San Mateo County voters approved Measure A which established the San Mateo County Transportation Authority (SMCTA) and a one-half cent sales tax to fund a number of transportation system improvement projects. The new sales tax is anticipated to generate \$804.1 million in sales tax revenues during the next 20 years. SMCTA will allocate money from this fund to build San Mateo County Sales Tax Expenditure Plan projects such as CalTrain extensions, railroad grade separation projects, roadway improvements to Highways 1, 101, 92 and 280, and bicycle facilities. This fund also supports Transportation Systems Management (TSM) Plans described in the next section.

4. San Mateo County Transportation Systems Management Plan

Measure A also required the San Mateo County Transportation Authority to prepare a Transportation Systems Management (TSM) Plan and that it be adopted by the County and the cities within the County. The primary objectives of the TSM Plan are to: (1) reduce work-related vehicle trips and miles of travel during the commute peak hour, (2) to achieve a 25 percent non-single-occupancy vehicle travel by employees during weekday commute periods, and (3) reduce air pollution and other environmental impacts of traffic congestion. The County and 16 of the 20 cities in the County are required to adopt trip reduction ordinances and implement Transportation Demand Management (TDM) programs because their jurisdictions include large employers with more than 100 employees.<sup>47</sup> TDM programs encourage employees to travel by modes other than the single-occupancy vehicle by providing incentives like ridesharing, alternative work hours, parking management, transit subsidies, telecommuting, and on-site bicycle/shower facilities. Most of the cities have combined their TDM programs by joining either the Intercity TSM Authority (ITSMA) and the Multi-City TSM Authority (MCTSMA). ITSMA and MCTSMA are joint power agencies the cities created to consolidate their TDM programs and reduce administrative costs. The County is in the process of joining these joint power agencies. Menlo Park administers an independent TDM program. In addition, the City/County Council of Governments (C/CAG) adopted the TSM as the County Congestion Management Program's TDM element.

TDM program requirements vary throughout the County. For instance, Menlo Park's TDM program plan requirement applies to employers with 25 or more employees instead of 100, ISTSMA's afternoon commute period is between 3:00 and 7:00 p.m. instead of 4:00 to 6:00 p.m., and Menlo Park and ITSMA both require annual, rather than periodic, employee TDM surveys. These requirements will be revised and may become more consistent when the Countywide TSM Plan is changed during the next year.

C. COUNTY PLANS AND REGULATIONS

Although the County does not directly regulate air pollutants, several of its plans and regulations indirectly affect the location and volume of emissions that occur within the unincorporated part of the County.

1. San Mateo County General Plan (1986)

A number of policies contained in the San Mateo County General Plan (1986) affect the quality of the County's air resources. These policies call for measures that either indirectly reduce air pollution emission or limit public and natural resource exposure to air pollution. The Urban Land Use and Transportation Chapter policies generally reduce mobile source emissions by calling for coordinated development of land use and public transit facilities to reduce vehicle trips and vehicle miles traveled. Specifically, Urban Land Use Chapter Policies (8.22, 8.29, and 8.30) indirectly reduce mobile source emissions by calling for the location of industrial land uses near transportation facilities and urban infill development and mixed use development along major transportation corridors. Transportation Chapter Policies (12.15, 12.21-12.33, 12.34-12.40) indirectly reduce mobile source emissions by supporting the development and use of public transit, bicycle and pedestrian facilities.

A number of the General Plan policies limit public exposure to air pollution by either minimizing development of stationary sources near residential areas or by controlling emissions from stationary sources. Mineral Resource and Solid Waste Chapters Policies (3.12, 3.13, 3.15, 3.16, 13.28) require that quarries and solid waste facilities be located in areas where their emissions would not adversely affect adjacent land uses. These policies also require that they mitigate any air quality impact that they may create.

2. County Development Regulations

a. San Mateo County CEQA Environmental Evaluation

The County is required by California Environmental Quality Act (CEQA) to determine if land use plans and zoning, subdivisions, and land use development may have a significant effect on air quality (and other environmental conditions). These projects will normally have a significant air quality effect if they: (1) violate any ambient air quality standard, (2) contribute substantially to an existing or projected air quality violation, or (3) expose sensitive receptors to substantial air pollutant concentrations.<sup>48</sup> If any of these effects are found, the project sponsor must prepare an Environmental Impact Report (EIR) that includes a mitigation plan specifying how these significant effects will be reduced or avoided. The County may approve the EIR as a part of a planning permit provided the State has found that the EIR is adequate. The County must monitor the mitigation plan to ensure the project's air quality effects are reduced to an insignificant level.

b. San Mateo County Zoning Ordinance

The San Mateo County Zoning Ordinance contains development regulations that affect the location and intensity of emission sources within the County. The development regulations which have



the greatest affect on air quality are the County's zoning district and parking regulations.

(1) Zoning Districts

Zoning district regulations control the distribution and density of residential, commercial, industrial, and agricultural/open space land development. Each district includes regulations that promote a different set of land uses. For instance, development in residential zoning districts (e.g., One-Family, Residential Hillside, Multiple-Family) is restricted to residential dwelling units and a few compatible institutional and recreational land uses to protect the residents' health, safety, and welfare. On the other hand, development in industrial zoning districts (e.g., Light Industrial, Heavy Industrial, Waterfront) is reserved for potentially objectionable or nuisance activities like manufacturing, transportation, and waste management. CEQA requires the County to evaluate the air quality effect of development in all of its zoning districts. In addition, the County's Light Industrial District and Resource Management District include development review criteria which evaluate the air quality effect of development.<sup>49</sup>

(2) Parking Regulations

Parking regulations require off-street parking as new development occurs or when there is a change or expansion of an existing use. The parking requirements specify the number of parking spaces based on land use type and density. For example, two off-street parking spaces are required for a single-family dwelling unit with two or more bedrooms, while a business office must provide one space for every 200 square feet of floor area. Where different land uses are part of a mixed use parcel, the amount of off-street parking required equals the total parking required for each use. Parking requirements can be reduced where adjoining land use enter into a "joint use off-street parking" agreement.

c. San Mateo County Subdivision Ordinance

The San Mateo County Subdivision Ordinance indirectly affects the air quality impact of mobile source emissions by specifying how new land subdivisions will be improved with roadways, transit facilities, bikeways, and public easements. Sections 7022 and 7023 specify roadway layout and construction design for all subdivisions, including provisions that limit the length of dead-end streets and cul-de-sacs to 600 feet and, in urban areas, require sidewalks along all public roadways. Section 7042 requires dedication of transit facilities when a subdivision will include more than 100 acres or 200 dwelling units. This section also requires the dedication of bikeways when the subdivision includes more than 200 parcels.



Sections 7058-7065 specify conditions when public access through a subdivision to the ocean or bay shoreline areas must be provided.

d. Grading Ordinance

The County Grading Ordinance regulates land excavation, grading, filling and clearing activities related to construction within the unincorporated part of the County. Section 8601.18 of the County Code requires that a Dust Plan be prepared that describes the method, equipment, and materials to be used to minimize and control dust arising from these activities.

e. Oil and Gas Regulations

The County Oil and Gas Exploration Ordinance regulates the location and operation of onshore oil or gas wells. Section 7703 to 7703.20 of the County Code requires that all oil and gas exploration and/or production wells include plans that demonstrate how any associated adverse air quality impact will be mitigated.

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## AIR RESOURCES ISSUES

### V. IMPORTANCE OF AIR RESOURCES

Air resource quality directly affects public health conditions, biologic stability, private property and community character, and visual quality within the County and the Bay Area. For these reasons, planning for the protection and management of the County's air resource is an important part of the San Mateo County General Plan.

#### A. PUBLIC HEALTH CONDITIONS

Public health conditions are deteriorated by polluted air when the population is exposed to high air pollutant concentrations. The County's young or elderly residents rely on clean air to maintain respiratory health. These residents are especially sensitive to the health effects associated with air pollution. Those who care for these residents, including the County, bear a significant social and financial burden.

#### B. BIOLOGIC STABILITY

Biologic stability is diminished when high air pollutant concentrations force plants and animals to relocate or perish. This can lower populations and threaten species diversity. Certain pollutants (NO<sub>x</sub> and SO<sub>2</sub>) are transported from the Bay Area to the Sierra Nevada Mountains where they form acid rain which threatens aquatic and forest resources. The ecological integrity of biotic communities become threatened to the extent that the communities can no longer function or are prone to invasion. To society, this may represent loss of a beneficial resource and increased environmental damage.

#### C. PRIVATE PROPERTY AND COMMUNITY CHARACTER

Private property and community character are damaged by polluted air when located near emission sources. Exposure to certain pollutants can damage vegetation and a wide variety of materials including fabrics, plastics, and rubber. Prolonged odors can be offensive enough to reduce property values and cause the long-term deterioration of residential neighborhoods. Buildings located in high particulate concentration areas will require increased exterior maintenance. These costs are a significant burden for the individual resident or landowner.

#### D. VISUAL QUALITY

Visual quality is degraded by air pollution during warm periods in the summer. During these periods, high ozone concentrations form a dense brown haze over the County's bayside and obscures views to the bay, the horizon, and other significant landmarks. When atmospheric clarity is reduced, County residents are not able to fully observe and appreciate its aesthetic and scenic qualities.



## VI. OPPORTUNITIES AND CONSTRAINTS

### A. ATMOSPHERIC CONDITIONS

Atmospheric inversions and topographic basins create conditions that allow air pollutants to concentrate and degrade local and area-wide air resource quality. Specifically, atmospheric inversions create cells of calm air that increase ambient air pollutant concentrations and form "hot spots." They are common during summer and autumn morning and afternoon hours and during cold, clear winter nights. A topographic basin shelters the air and creates pockets of calm air which allow emissions to form "hot spots." These pockets are found where slopes, buildings, or vegetation provide protection from the wind. Carbon monoxide, nitrogen oxides, PM10 and TAC emissions are of particular concern during stable environmental conditions, because they tend to linger near their source. Ozone is a concern during warm spring and summer periods. Air pollution exposure can become a significant public health hazard when these conditions occur in areas where population and emission sources are concentrated.

Techniques which reduce emissions to improve air resource quality or which prevent population exposure to air pollution will lessen this public health hazard. The most common technique used to reduce emissions is the emission control device and other "best available control technologies." This technical approach is used to directly reduce emissions released by commercial or industrial processes, residential water heaters, automobiles, and almost any other process that emits air pollutants. Another technique is to modify behavior that causes air pollution. The most common example are transportation control measures (TCMs) which are used to modify travel behavior. TCMs indirectly reduce mobile source emissions by using incentives or disincentives to encourage people not to drive automobiles. Carpooling, HOV lanes, Voluntary "No-Drive Days" and telecommuting are a few examples of TCMs that encourage people to change their behavior and reduce pollution. Finally, population exposure to air pollution can be limited by appropriate land use planning and site design. Land use plans (and zoning regulations) can prohibit homes, hospitals, schools, and other sensitive receptors from locating in areas where emission sources are concentrated. Careful site design can minimize population exposure by locating emission sources downwind from populated areas.

The air quality improvement these emission control measures produce will always be tempered by complex atmospheric processes that cannot be controlled. Seasonal and/or annual climatic variation can dampen or amplify the impact emission control measures have on air resource quality. Natural emission sources (e.g., plant respiration, decomposing organic debris, and exposed soil) will always limit how much of the County's total emissions can be reduced by emission control measures. However, the last 20 years have shown these measures have the potential to improve air resource quality in the County and the Bay Area, particularly on predicted carbon monoxide and ozone exceedance days.

## B. AUTOMOBILE AND OTHER VEHICLE EMISSIONS

Emissions from automobiles, buses, trucks, and aircraft have a huge impact on air resource quality within the County and the Bay Area. These mobile sources generate emissions that form hot spots along the County's freeways and major arterials and contribute to the Bay Area's ozone (smog) problem. On-road vehicles create congestion on the County's roadways which forces them to operate at less emission efficient speeds and emit more carbon monoxide, NO<sub>x</sub> and TAC than otherwise. These vehicles also disturb road dust which is the County's most significant source of PM<sub>10</sub>. Aircraft emissions associated with aircraft operations (e.g., taxi and takeoff/landing) generate emissions, degrade local air quality conditions and contribute to regional violations of air quality standards. These emissions aggravate or cause public health problems, damage property, and contaminate soils near congested or high volume roadways.

Emission control devices can directly reduce mobile source emissions generated by any vehicle powered by an internal combustion engine. Vehicles can be equipped with emission control devices (smog equipment) that recycle and filter emissions before they are released. These devices significantly reduce mobile source emissions and lessen their impact on air resource quality. Gasoline can be reformulated to burn completely during the winter months so that less carbon monoxide will be generated by mobile sources. However, these "clean-burning" fuels may contribute more nitrogen oxides to the Bay Area's ozone problem. Fuel efficient vehicles, alternative fuel and hybrid vehicles generate less emissions per mile than traditional gasoline (or diesel) vehicles and will help to improve air resource quality over time. Although electric-powered vehicles do not emit pollutants when they are operating, they generate emissions at power generation plants when they are being recharged. Regular vehicle maintenance will extend emission efficient performance and reduce their lifetime emissions. A program to retire older vehicles once they are not able to perform at emission efficient levels eliminate the worst polluters from the road. And, finally, mobile source emissions from all kinds of vehicles, particularly aircraft, can be reduced by reducing the time spent idling or moving at low speeds.

It is expected the long-term air resource improvement produced by emission control devices will be offset by population and economic growth in the County. This will occur because automobile travel will continue to be convenient and affordable for most of the County's residents and employees. As a consequence, this growth is expected to add automobile trips and spread traffic congestion within the County. The political and public support for further emission control technology advancements may subside because their cost to the consumer will increase and their ability to improve air resources will lessen. Also, any measure to reduce automobile travel will rely on voluntary efforts by individuals who have a protected right to travel by automobile or any other mode.



### C. ECONOMIC ACTIVITY

The County's economy includes business activities that generate stationary source emissions which degrade local air resource quality and contribute to the Bay Area's ozone problem. The most significant source of these emissions are businesses that consume fuel, use surface coatings or solvents, or refine, store, or distribute fuels or organic liquids. These businesses include small firms (e.g., auto body shops and dry cleaners) as well as large firms (e.g., chemical refining plants in the North Bay or cement kilns throughout the region). Their individual emissions can degrade local air resource quality enough to become a significant public health concern. For example, dry cleaning establishments use solvents that release TAC emissions which, in a populated area, expose people to increased health risks even at low concentrations. When considered collectively, stationary sources emit almost 25 percent of the County's total reactive hydrocarbons. These emissions are ozone precursors and contribute to the Bay Area's current ozone problem. By 2000, economic activity in the County is expected to increase significantly which, in turn, is expected to increase stationary source emissions.

Stationary source emissions can be reduced by directly controlling the processes that generate them. Fuel combustion emissions can be reduced by best available control technologies that filter or recycle air pollutants before they are released into the atmosphere. This method is used to reduce nitrogen oxides, hydrocarbons, and other emissions associated with any internal combustion engine, power plant or factory equipment, or residential water heater. Surface coatings (e.g., inks, paints and varnishes) and solvents can be reformulated to reduce the emissions they release as they dry or evaporate. Emissions from fuels/organic liquids refining, storage and distribution can be reduced by vapor recovery systems and leakless valves. These vapor recovery systems reduce emissions by capturing or recycling vapors that would otherwise be released into the atmosphere. For instance, vapor recovery systems can be installed on gas station pumps to reduce reactive hydrocarbon emissions during automobile refueling. Leakless valves reduce emissions by limiting accidental spills during routine operations. When implemented together, these controls can significantly reduce stationary source emissions enough to help improve local and areawide air resource quality.

Long-term County economic growth may offset the overall air resource improvement that can be produced by these stationary source controls. Economic growth is a broadly supported public policy and business objective, because it stimulates commerce, provides jobs, and generates tax revenues. This growth will also increase the number of stationary sources that contribute to the County's total emissions. Efforts to control economic growth could be developed to reduce these emissions by limiting air polluting business establishments. However, this emission control approach is not practical because, it would conflict with many other economic and social objectives.



#### D. LAND USE DEVELOPMENT

Urban land uses attract or generate automobile trips that influence where and when mobile source emissions and traffic congestion occur in the County. Low-medium density residential and manufacturing uses generate more automobile trips because they are generally not served by transit and are isolated from commercial centers. Most of the residential and manufacturing areas east of the Bayshore Freeway are examples of this type of setting. People who live or work there virtually have no other alternative than to travel by automobile. The County's downtown commercial/office districts, shopping malls, and transportation hubs (particularly San Francisco International Airport) are major trip generators because they provide goods and services for the County and the Bay Area. They encourage automobile travel by locating near major roadways and freeways, and by providing parking and other automobile facilities. Employees driving to and from the County's employment centers routinely cause traffic congestion on surrounding roadways during morning and afternoon commute periods. This is particularly evident within the Bayshore Freeway Corridor where most of the County mobile sources are concentrated. As a result, there is a strong relationship between land use trip generation characteristics and the concentration of mobile source emissions in the County. This relationship establishes these areas as "indirect sources" of air pollution.

Land use plans, zoning, and subdivision regulations can use indirect source controls to reduce mobile source emissions and traffic congestion. In general, indirect source controls are development regulations that minimize dependence on automobile travel. High density housing, mixed use development, and employment areas located near transit stations or routes will encourage people to use transit when shopping or commuting to work. Mixed use development within residential areas or employment centers or near transit allow people to complete daily errands by walking and not driving. Mixed use development provides excellent settings for transit stops. Roadway improvements between residential areas and nearby shopping and employment centers should incorporate sidewalks, pathways, and street crossings. Safe, convenient, and pleasant pedestrian/bicycle facilities are essential to encourage people to walk or bicycle instead of drive. New subdivisions and land use development can include site design features such as sheltered transit waiting areas, preferential transit access, and convenient pedestrian access to adjacent areas. Also, land use development can include parking and drive-up service windows restrictions to discourage automobile travel and reduce vehicle idling.

Indirect source controls will produce long-term air quality benefits provided planners and policy makers overcome local constraints in San Mateo County which may otherwise diminish their effectiveness. First, there are only a few remaining vacant parcels or under utilized parcels in the County to be developed or redeveloped. It is anticipated land use development will be incremental and the County's existing land use patterns will change slowly. As a result, indirect source controls

will not produce substantial short-term air resource or traffic circulation improvements. Instead, they will ensure the cumulative air quality and traffic impacts of development within the County will be minimized over the long term. Second, development of transit stations or high density housing is controversial. Neighboring residents resist this kind of development because they perceive increased land use activity and traffic congestion will deteriorate their quality of life. Local government legislative bodies may resist because this kind of development could conflict with community expectations or with established local land use policies. It is important to demonstrate these projects support community goals to reduce congestion, create affordable housing, protect open space, and use community infrastructure and services efficiently. Third, it is commonly held that automobile access or parking restrictions conflict with free market business practices by reducing business activity. The market value of commercial land is, in large part, based on automobile access and parking supply. Commercial land developers and their lenders prize land near major roadways with enough space for parking, as well as stores, because most of their patrons travel by automobile. Consequently, such measures can only be imposed when transit and pedestrian access is expanded and/or nearby residential/employment development densities are increased.

#### E. TRANSPORTATION SYSTEM

The County's transportation system of roadways, transit systems, and intermodal transfer facilities significantly influence air resource quality and traffic congestion in the County. Table 2 shows that the County's transportation system conveys 1.7 million daily trips and that virtually all of these trips are by automobiles driving on the County's roadways. Figure 8 shows these automobile trips create congestion on County roadways that are operating near capacity. Vehicles operating on these roads travel at lower average speeds in stop-and-go conditions where they emit the most air pollution. Their pollutants can form hot spots that degrade local air resource quality and pose a significant health threat for nearby sensitive receptors. By 2000, the County's average daily trips are expected to increase by 17 percent while its roadway capacity will essentially remain unchanged. Congestion is expected to spread and local air quality near major arterials will worsen.

Transportation system improvement measures such as traffic management systems, high occupancy vehicle (HOV) facilities, and roadway improvements can reduce automobile emissions and congestion by improving roadway efficiency. These measures are especially effective when they are implemented in regularly congested arterial and freeway corridors together with indirect source control measures and travel demand management measures. Traffic management systems minimize stop-and-go driving during heavy traffic flow conditions. These systems include ramp meters, traffic advisory signs, traffic surveillance and incident management, and timed signals. Ramp meters limit freeway access to ensure roadway capacity is not exceeded. Traffic advisory signs provide information drivers can use to avoid congestion by traveling alternate



routes. Traffic surveillance systems allow road crews to clear accidents quickly before they back up traffic. A network of timed signals reduces vehicle idling time on arterial roadways. HOV facilities increase roadway efficiency by increasing average vehicle ridership. They encourage people to carpool or ride the bus by providing convenient parking facilities and/or dedicated HOV lanes ("diamond lanes"). Park and Ride facilities provide HOV riders convenient access to carpools, shuttles, buses, and other transit services. Diamond lanes allow HOV riders to avoid congestion delay along regularly congested roadways and bypass bottlenecks at bridge tolls. HOV facilities are most effective when they are developed within a congested corridor serving a major employment center such as San Francisco. Roadway improvements can increase average vehicle speeds by reducing the potential for disrupted traffic flow. Railroad/ roadway grade separations, dedicated turn lanes, bus turnout bays, and on-street parking restrictions minimize turn conflicts that cause stop-and-go driving on major arterials. These improvements will reduce mobile source emissions provided they do not attract additional trips. This can be accomplished in severely congested areas when parking restrictions, traffic barriers, and convenient transit facilities are implemented together to discourage automobile travel.

Public opposition and right-of-way conflicts limit the extent that some of the transportation system improvement measures can be used to reduce air pollution and traffic congestion in the County. Public opposition often accompanies changes to established roadways that produce spillover traffic impacts. This constraint is of particular significance when new HOV lanes, traffic barriers, or on-street parking restrictions change established traffic circulation patterns that either increase traffic congestion in residential areas or decrease traffic access to commercial areas. Right-of-way conflicts at railroad/roadway crossings will limit the effectiveness of signal timing on many of the County's arterial roadways. When a train passes through an on-grade crossing, nearby intersection signals are overridden to stop traffic. All of these crossings are located within the County's most congested corridor, and are most heavily used by trains and vehicles during peak commute periods.

#### F. TRAVEL BEHAVIOR

Travel behavior has a significant air quality and traffic congestion impact in the County because County residents overwhelmingly travel by automobile. People choose to use the automobile for most trips, primarily due to the automobile's ability to complete any trip with speed, ease, and efficiency. About three-quarters of the County's total daily trips are for non-work trips involving routine household errands or recreation (e.g., shopping, taking children to school)--98 percent of these trips are completed by automobile and 2 percent by transit. These non-work trips occur throughout the day and usually involve short distances between nearby residential and commercial areas. About one-quarter of the County's total daily trips are by people who commute to or from work--about 94 percent are completed by automobile and 6 percent by transit. Almost all of these trips occur during the morning and



afternoon commute periods, and they usually travel longer distances than non-work trips. A proportion of these trips are by single-occupancy vehicles. Almost 77 percent of these work trips are people commuting in a single-occupancy vehicle. A large portion of the transit work trips are by people who work in downtown San Francisco and commute by rail to avoid congestion delay. Besides being valued for its ability to quickly and easily complete just about any trip, people value the automobile for its efficiency. It allows people to link different trips together and save time. For instance, a parent can pick up their child at day care while driving home from work.

Encouraging people to reduce their automobile trips by using transit, bicycling, or walking can reduce mobile source emissions and reduce traffic congestion. A variety of transportation demand management measures (TDMs) have been developed to persuade people to travel by any means other than the single-occupancy vehicle. Expanded transit service, transit and carpool subsidies, restricted and/or paid automobile parking, increased bridge tolls, preferential carpool/vanpool parking, flexible work hour schedules, and ride matching services are opportunities to target drivers of single-occupancy vehicles who travel in routinely congested corridors. Protected bicycle facilities, changing rooms and showers target drivers who travel less than 5 miles over relatively flat terrain. On-site support services (e.g., child care, food services, ATMs) target employees who would otherwise leave the work place to eat lunch or do personal errands. Telecommuting targets employees who can work at home during normal business hours. "No-drive" days target all drivers by asking them to voluntarily curtail all discretionary or unnecessary travel on smog alert days. These measures can change travel behavior enough to reduce emissions generated by automobile travel particularly when they are widely implemented and supported by complementary indirect source controls and transportation system improvements. As a result, extensive local and regional government coordination and public education is usually required. The complexity of this task has lead government agencies to develop joint transportation system management plans (TSM) and trip reduction ordinances that usually require large employers to implement many of the above TDMs.

Transportation demand management (TDMs) measures can produce both short-term and long-term air quality and congestion relief in San Mateo County provided public policy makers overcome local conditions that foster automobile dependence. First, automobile dependence will only be reduced when other travel alternatives are available. Many County residents live in areas away from commercial districts and work at distant jobs. Because it is not likely these residents will change their mode of travel, travel demand management measures should encourage these residents to carpool and link their trips together to the maximum extent possible. Second, the automobile is chosen for work trips because it is usually the fastest and sometimes the only means of travel available. This is particularly true for people who do not work in a major employment center like downtown San Francisco. Special effort should be made to make commute transit trips as direct and convenient as possible. In particular, measures should target congested roadway

corridors where existing transit service capacity or frequency can be expanded or extended. Third, some demand management measures conflict with publicly held equity objectives and economic growth goals. Measures like parking fees are viewed as inequitable because lower income people who rely on automobile travel bear a disproportionate burden. They may increase business operating costs and encourage business owners to relocate elsewhere and reduce County jobs and revenue. These measures must be balanced by tangible air quality and mobility benefits that do not burden low income people or businesses within the County. Finally, these measures are only incentives to influence travel behavior which can change at any time. Maintaining transit ridership or travel by any other non-single occupancy vehicle will largely depend on ongoing commitment by local agencies and business to implement a full complement of TDMs that are supported by indirect source controls and transportation system improvements.

## VII. EVALUATION OF EXISTING PLANS, REGULATIONS AND POLICIES

### A. ATMOSPHERIC CONDITIONS

#### 1. Bay Area Air Quality Plan (1982)

The federal Bay Area Air Quality (AQP) has been effective in significantly improving Bay Area air quality and is expected to contribute to continued improvement. The reasons it is effective are because (1) the EPA, BAAQMD, and MTC worked together to identify emission controls best suited to reduce Bay Area air quality violations, and (2) the EPA has the authority to withhold federal highway funds should the Plan not be fully implemented. This authority was successfully used to require that MTC fully evaluate CalTrans' highway project air quality effects before federal funds may be allocated for an East Bay highway expansion project.

The AQP could be more effective if additional controls were placed on PM10, because attainment of air quality standards is not expected using existing controls. The program could also be more effective if more funding were available for implementation.

#### 2. Bay Area Clean Air Plan (1991)

The State Bay Area 1991 Clean Air Plan (CAP) effectively implements an emission reduction strategy that will improve Bay Area air quality. Contributing to its effectiveness, the Plan (1) expands BAAQMD's successful stationary source control regulations to control emissions from small point sources and from area sources; (2) establishes transportation control measures (TCMs) that indirectly reduce mobile source emissions; (3) delegates some TCMs to cities and counties when local TCM implementation is more effective; and (4) establishes regionwide standards and implementation schedules that ensure all Bay Area residents, workers, employers, and agencies equitably share the burden to reduce emissions.

The effectiveness of the CAP can be increased if (1) the State legislature grants additional authority and funding to appropriate agencies to implement Phase II TCMs, (2) specific controls where developed to reduce PM10 and TAC emissions generated by automobile travel, and (3) additional authority where granted BAAQMD to regulate emissions generated by aircraft operations.

#### 3. Bay Area Toxic "Hot Spot" Program

The BAAQMD Hot Spot Program effectively reduced public exposure to toxic air contaminants (TAC) from stationary sources. It is effective because (1) BAAQMD prepares an annual TAC report identifying major TAC sources in the Bay Area and this motivates business owners to reduce TAC emissions and avoid negative publicity by BAAQMD; (2) BAAQMD will advise and work cooperatively with business owners to develop and implement emission reduction plans; and (3) the program systematically targets TAC stationary sources near residential areas.



The program's effectiveness could be improved by (1) increasing BAAQMD survey audits, ongoing monitoring and enforcement activities, and (2) developing controls to reduce TAC emissions from mobile sources.

4. San Mateo County General Plan (1986)

The San Mateo County General Plan has not adequately promoted regulations or programs that protect air quality or reduce emissions within the County. The key limitations of the Plan are that (1) it has not directly assessed or planned for air resource quality within the County, (2) its land use, transportation and manmade hazards policies are not tied to air quality goals or emission reduction standards, (3) almost all of the County's stationary and mobile sources are outside of the County's jurisdiction, and (4) its development policies are directed toward new land use development. Currently, air quality issues are only considered in the Plan's Environmental Impact Report, and are identified as insignificant environmental effects of the Plan.

The effectiveness of the Plan can be strengthened by (1) incorporating specific air quality goals and emission control standards, and (2) promoting air quality objectives in all Countywide land use and transportation planning programs and regulations.

B. AUTOMOBILE AND OTHER VEHICLE EMISSIONS

1. State Vehicle Emission Control Program

The California Air Resource Board's (CARB) existing vehicle emission control program has effectively reduced mobile source emissions and significantly improved regional air quality. The program is effective because it (1) establishes appropriate Statewide fuel efficiency and emission standards, (2) enforces a smog inspection program, and (3) requires the sale of clean-burning gasoline during winter months. Key to affecting compliance, CARB will block vehicle registration renewal for non-complying vehicles.

The effectiveness of CARB's program could be improved by (1) expanding its fuel efficiency and emission standards to include motorcycles, heavy-duty trucks, buses, off-road vehicles, and aircraft; (2) imposing stricter smog inspection requirements and increasing smog repair cost limits; (3) requiring reformulation of diesel fuel; (4) implementing an old vehicle retirement program; and (5) developing and implementing TAC and PM10 emission controls and standards for all vehicles.

2. Bay Area Clean Air Plan (1991)

The 1991 Clean Air Plan's Smoking Vehicle Program (SSC H1) and the voluntary ozone excess "no-drive day" (TCM 23) programs directly reduce mobile source emissions emitted by motor vehicles. The Smoking Vehicle Program is effective because (1) it may accelerate retirement of older, less emission efficient vehicles, (2) it encourages all automobile owners to properly maintain their vehicles, and (3) the State Department

of Motor Vehicles records all offenses and may issue a fine. The "no-drive day" program is effective because it encourages drivers to limit unnecessary trips or to link trips during periods when BAAQMD predicts ozone or carbon monoxide exceedances.

The effectiveness of these programs would be improved by dismissing smoking vehicle fines in return for owners who retire their vehicles, and by increasing public information/notification during predicted exceedance periods.

C. ECONOMIC ACTIVITY

1. Bay Area Clean Air Plan (1991) - Stationary Source Control Measures

The 1991 Clean Air Plan contains stationary source control measures that have effectively reduced criteria pollutant emissions and air quality violations in the County and the Bay Area. These measures have and will continue to be effective because they (1) build on BAAQMD's successful stationary source control program, (2) require existing stationary sources to install best available retrofit technology, (3) include intermittent controls that encourage businesses to curtail or postpone emission activities during forecast ozone and carbon monoxide excess days, and (4) are enforced by BAAQMD, who has the authority to impose penalties throughout the region.

Its effectiveness can be improved by (1) increased BAAQMD monitoring and enforcement activities, and (2) encourage all stationary sources, including residential area sources, curtail emission activities on forecast ozone and carbon monoxide excess days. Currently, many non-complying emission sources are brought to the District attention by environmental or neighborhood organizations.

2. Bay Area Toxic "Hot Spot" Program

The BAAQMD's Toxic Air Contaminant Control Program, or "Hot Spots" Program, effectively reduces the TAC public health exposure from the County's most significant TAC stationary sources. It is effective because (1) TAC emissions from all BAAQMD permitted emission sources in the Bay Area are evaluated; (2) TAC emission reduction near residential areas is given greatest priority; (2) BAAQMD will work cooperatively with sources to reduce TAC emissions; and, finally, (3) BAAQMD notifies affected residents and local newspapers about the Air Toxics Health Risk Assessment results which encourages businesses to reduce their TAC emissions and avoid negative publicity.

The program's effectiveness could be improved by (1) expanding the program to assess TAC health risk wherever population concentrations occur, and (2) increasing BAAQMD survey audits, monitoring, and enforcement activities.

3. San Mateo County General Plan (1986)

The General Plan has not adequately promoted stationary source emission reduction programs or regulations. The key limitations of the Plan are that it does not (1) evaluate the relationship between economic development and stationary source emissions, (2) include land use development emission control standards, and (3) explicitly support regional air quality objectives. Also, its effectiveness is limited because most of the County's stationary sources, including San Francisco International Airport, are located outside of the County's land use jurisdiction.

The effectiveness of the General Plan can be improved by (1) incorporating air quality goals that explicitly support regional air quality programs, plans and regulations, and (2) establishing specific regulation of development policies that strictly limit emissions from stationary sources near any sensitive receptor.

4. California Environmental Quality Act - Environmental Impact Reports

The California Environmental Quality Act (CEQA) regulations effectively reduce emissions from new stationary sources. They are effective because they require local agencies to (1) assess the air quality impact of all new development and, if necessary, require reduction of any adverse emissions they may generate; (2) provide public review and discussion which ensures air quality issues and emission control measures are fully considered; and (3) monitor the ongoing effectiveness of mitigating emission control measures.

CEQA's effectiveness could be improved by (1) providing public agency staff with air quality impacts assessment training; (2) requiring early project review to integrate source reduction strategies in the project design; and (3) establish strict guidelines that limit instances when municipalities may override significant air quality impacts and grant project approval.

5. San Mateo County Grading Ordinance

The County's Grading Ordinance does not effectively reduce particulate (PM10) emissions from stationary sources, e.g., construction sites. It is ineffective because it does not require (1) implementation of best available control technology, (2) staff to monitor grading activities, and (3) staff oversight responsibility is not clear.

The effectiveness of this ordinance would be improved by requiring as a condition of grading permit approval that developers (1) implement best available dust control technology, (2) post a performance bond to ensure compliance, (3) pay an inspection fee, and (4) develop a monitoring program.



D. LAND USE DEVELOPMENT

1. Bay Area Clean Air Plan (1991) - Indirect Source Review

BAAQMD does not have an indirect source control program; it currently assesses the air quality impact of proposed land use development during CEQA review. The effectiveness of this review is somewhat limited because BAAQMD (1) can only recommend, and not require, new land uses to reduce or mitigate emissions released by the trips they generate, and (2) cannot adequately monitor and enforce long term implementation of emission reduction measures. BAAQMD's review would be more effective if District recommendations would be included during the project's initial design stages.

It is anticipated BAAQMD's proposed Indirect Source Control Program (TCM 16) will effectively reduce mobile source emissions indirectly generated by regionally significant land uses such as airports and shopping centers. The effectiveness of this program hinges on the BAAQMD's (1) permit authority to deny or halt development or continued operation of any land use activity that causes significant air pollution, (2) expertise to develop and enforce suitable control measures for a variety of settings, (3) flexibility to delegate its authority to a municipality when appropriate, (4) development of regional on-site control standards, and (5) ability to encourage landowners to comply with program guidelines.

The effectiveness of this program would increase if (1) municipalities amend their development regulations to include BAAQMD's adopted indirect source control measures, and (2) local land use development review include an indirect source control evaluation.

2. Bay Area Clean Air Plan (1991) - Implementation Support

The BAAQMD's General Plan Air Quality Element Program (TCM 19) is effective, because it supports efforts to adopt local land use, housing and transportation policies that are consistent with regional air quality objectives. The effectiveness of this program is largely due to BAAQMD's (1) providing policy guidelines and technical support to help municipalities prepare air quality plans and policies, (2) requiring municipalities to adopt air quality policies before they may be delegated BAAQMD's Indirect Source Control Program (TCM 16) authority, and (3) awarding Vehicle Registration Fee Program points to municipalities with adopted air quality policies. This program supports TCM implementation by ensuring local land use, housing and transportation policies are consistent with regional air quality objectives.

The effectiveness of this program could be increased by (1) amending State Planning Law to make Air Quality Elements a required General Plan chapter, (2) expanding BAAQMD funds to aid Air Quality Element preparation, and (3) regular updating and distributing of the District's "Local Air Quality Elements" guideline to municipalities.

3. San Mateo County Congestion Management Program (1991)

The CMP's effect on mobile source emissions generated by new development is limited. The Plan's effect is limited because (1) the CMP Land Use Impact Analysis Program (LUI) cannot assess the traffic or air quality impact of small infill development projects, (2) only traffic and air quality impacts on the CMP Network are evaluated, (3) required congestion relief measures may increase CMP Network capacity and increase vehicle trips and emissions, and (4) the San Francisco International Airport expansion project may be exempt from the County's CMP.

The CMP would be more effective if (1) the LUI modeling capabilities are used as a long range planning tool to balance land use development with transportation system and air quality improvements, (2) the CMP land use development review thresholds are made more stringent, (3) the CMP network is expanded to include all the County's arterials, (4) the congestion reduction measures are required to reduce vehicle trips and mobile source emissions as well as congestion, (5) State law where amended to require the CMP to be consistent with regional air quality plans, and (6) State law is amended to require San Francisco International Airport to comply with the County's CMP.

4. San Mateo County General Plan (1991) - Land Use Policies

General Plan Land Use policies implements BAAQMD and MTC programs. Most notable are the policies that promote jobs/housing balance and high density, mixed use development near transit facilities (General Plan Policies 8.22, 8.29, and 8.30). These policies stimulated preparation of the Colma Area Plan and the Colma BART Station Specific Plan which establish higher density mixed use residential/office/commercial development near a major transit station. The effectiveness of the General Plan land use policies can be enhanced by linking land use development with specific mobile source and trip reduction objectives.

The effectiveness of the General Plan could be strengthened by adopting policies that (1) limit development of major land use destinations to areas served by transit facilities, (2) protect sensitive receptors from mobile source emissions, (3) prohibit automobile facilities that attract vehicle trips or increase vehicle idling, (4) establish higher development densities near transit facilities, and, in all cases, (5) clearly support and conform with regional air quality objectives.

5. San Mateo County Subdivision Ordinance

The Subdivision Ordinance requirements do not effectively reduce vehicle trips and their emissions in San Mateo County. Their effectiveness is limited by the lack of land in the County where the transit and bicycle facility improvement requirements would apply. These requirements are most effective in areas experiencing rapid urban development, such as Contra Costa County.



The effectiveness of the ordinance could be increased by requiring all subdivisions to (1) build or fund pedestrian/bicycle paths established in the General Plan, and (2) connect subdivision roadways and pedestrian/bicycle paths with existing facilities where possible. These requirements would limit cul-de-sac street development and provide improved circulation and access for walkers, bicyclists, and automobiles.

6. San Mateo County Development Regulations

The County Development Regulations do not effectively reduce vehicle trips and mobile source emissions generated by land use development. These regulations are ineffective primarily because the parking provisions (1) require that all new development or major renovation provide patrons or residents with ample parking, and (2) effectively restrict joint parking arrangements.

The Development Regulations would be more effective if it is amended to (1) reduce parking requirements in areas served by public transportation, (2) require preferential parking for high occupancy vehicles and bicycles, (3) reduce parking requirements when new development includes transit facilities or services or when parking fees are imposed, (4) require that preferential parking or transit facilities and services are located at or near main building entrance, (5) encourage joint parking facilities particularly where park-and-ride lot opportunities exist, (6) prohibit automobiles to drive through facilities at business establishments, and (7) establish permit parking zones in areas adjacent to major trip generators.

E. TRANSPORTATION SYSTEM

1. Bay Area Clean Air Plan (1991) - Traffic Operations Management

The Clean Air Plan includes two measures, Install Freeway Traffic Operations System (TCM 11) and Improve Arterial Traffic Management (TCM 12), that effectively reduce congestion related emissions by improving traffic flow on the County's freeways and arterials. These measures are effective because they (1) build on existing clean air provisions in the MTC Regional Transportation Plan, (2) provide greater coordination between local and regional agencies, and (3) place greater emphasis on consistency between traffic flow and air quality objectives. Failure to implement these measures violates the federal Clean Air Act and may jeopardize federal funding.

The effectiveness of these measures would be improved by establishing funding sources in addition to AB 434 to accelerate implementation of local and regional projects.

2. Bay Area Regional Transportation Plan (1991)

MTC's Regional Transportation Plan (RTP) effectively guides regional efforts to reduce mobile source emissions by reducing vehicle travel and congestion. The plan plays a key role in this regional effort because



it: (1) sets forth a comprehensive transportation plan that coordinates the development and operation of the Bay Area's transportation facilities, e.g., roadways, transit and intermodal stations, (2) gives priority to projects which reduce vehicle travel and congestion, (3) supports development of regional traffic operating system to reduce freeway congestion, (4) controls allocation of federal and State funds for region's transportation system, and (5) promotes locally initiated transportation plans such as the CMP. Failure by MTC to demonstrate how regional air quality objectives will be furthered by RTP projects would violate the federal Clean Air Act Amendment and subject the Bay Area to revoked federal highway funds.

The effectiveness of the Regional Transportation Plan would be improved if (1) all Bay Area counties were required to prepare Countywide Transportation Plans, and (2) federal and State funds not be assigned to specific projects, but rather to a fund for MTC to allocate according to RTP project priorities.

### 3. San Mateo County Congestion Management Program

The San Mateo County Congestion Management Program (CMP) does not adequately support regional mobile source emission reduction efforts. The plan is not effective in reducing mobile source emissions because (1) its existing capital improvement program gives priority to roadway improvement projects that may generate additional mobile source emissions, and (2) many of the County's congested arterials are not part of the CMP Network. Although the CMP Travel Demand and Trip Reduction Element establishes a congestion reduction strategy to reduce mobile source emissions, this effort is diminished by the program's other elements.

The CMP could more effectively support mobile source emission reduction efforts if (1) the CIP selection process is revised to give greater priority to projects that increase transit use and reduce vehicle trips and travel, and (2) the CMP Network were expanded to include all of the County's arterials.

### 4. San Mateo County Transportation Expenditure Plan (1988)

The San Mateo County Transportation Expenditure Plan (Measure A) has components that collectively improve the transportation system capacity and efficiency and thereby reduce emissions; however, its focus on traffic congestion hampers its overall effectiveness. The effectiveness of Measure A is limited because it funds roadway capacity expansion projects along the Bayshore Freeway, Highway 92 and the Bayfront Expressway that may increase vehicle travel and reduce mobile source emissions. However, Measure A does support efforts to reduce mobile source emissions by funding (1) railroad grade separation projects at the County's most congested railroad crossings, (2) expanded rail service in the County to encourage increased transit use, and (3) ongoing Countywide TSM activities to reduce single- occupancy vehicle travel.

The effectiveness of Measure A would improve if roadway improvement projects were required to include (1) HOV facilities to ensure vehicle trips and emissions will increase in the long-term, and (2) bicycle and pedestrian facilities to encourage non-motorized travel.

5. San Mateo County General Plan (1986)

The San Mateo County General Plan effectively supports regional and local measures to reduce traffic congestion and mobile source emissions. The Plan is effective because it (1) promotes Countywide transportation programs such as TSM; (2) describes and evaluates Countywide transportation issues; and (3) reconciles transportation goals with the Plan's land use and housing development goals.

The plan's effectiveness would be strengthened by including policies that (1) require consistency between County roadway improvement projects and General Plan policies and other County programs, (2) encourage improved arterial operations within urban areas to foster efficient travel and minimize mobile source emissions, (3) identify transportation corridors where capacity would accommodate intensified development, and (4) in rural areas carefully review the effect proposed roadway improvements may have on land use development and air quality.

F. TRAVEL BEHAVIOR

1. Bay Area Clean Air Plan (1991) - Employer Based Trip Reduction

The Clean Air Plan includes two programs, Expand Employer Assistance Program (TCM 1) and Employer-based Trip Reduction Rule (TCM 2), that will have limited effect on reducing single-occupancy vehicles and their associated emissions. Experience with a similar TSM program in San Mateo County indicates these measures will encourage transit travel but have limited effect on single-occupancy vehicle travel. These programs will encourage transit travel because employers will provide employees with information and/or services to encourage transit/carpool travel, and transit agencies will expand existing services or develop complementary services to fulfill increased transit demand. However, these programs will not significantly reduce total single-occupancy vehicle travel, because they only target work trips, and they do not provide employees with transit alternatives that are as fast, flexible, and affordable as automobile travel.

The effectiveness of the trip reduction rule will be increased if it and complimentary measures exist that will (1) save employees significant time by using transit or carpooling, e.g., HOV lanes that allow carpools to bypass congestion, (2) increase automobile travel cost significantly, (3) improve transit services so that transit can be used to complete linked commute and shopping trips, (4) require small firms (less than 100 employees) to provide employees with transit information and incentives, and (5) simplify the program by having the same standards administered by one Countywide agency.



2. Bay Area Clean Air Plan (1991) - Mobility Improvements

The Clean Air Plan (CAP) includes eight TCMs that promote travel by means other than the single-occupancy vehicle to reduce mobile source emissions. Six of the eight TCMs are effective and include Improved Areawide Transit Service (TCM 3), Rail Extensions (TCM 4), Improve Access to Rail and Ferries (TCM 5), Intercity Rail Service (TCM 6), Carpool and Express Bus Lanes on Freeways (TCM 8), and Bicycle Access and Improvements (TCM 9). These TCMs are effective because they will (1) expand on existing bus and rail transit services, (2) increase feeder bus/shuttle service and parking capacity at transit stations, (3) promote bicycle storage facilities and carry-on transit service, and (4) increase HOV lanes and park and ride facilities. Implementation of the remaining two TCMs, Youth Transportation (TCM 10) and Transit Use Incentives (TCM 13), is limited because they are inadequately funded and/or rely on administration by many separate school districts, transit agencies, or employers.

The effectiveness of these eight TCMs would increase if (1) vehicle operating cost were significantly increased by mandatory parking fees, toll road/congestion fees, gasoline taxes and/or vehicle registration fees, (2) transit agencies were required to coordinate routes, schedules and fares, (3) additional funds were made available to fully implement these programs. Because these TCMs would increase bus emissions and transit station congestion, further effectiveness would result if transit agencies (4) replace old buses with low emission diesel or alternative fuel buses, and (5) provide shuttle buses, very low emission vehicles, bicycle, and pedestrians with priority access to transit stations.

3. Bay Area Regional Transportation Plan (1991)

The Regional Transportation Plan (RTP) effectively supports regional efforts to reduce mobile source emissions. The RTP is effective because it (1) assesses the overall performance of the region's various transit services, (2) promotes transit service coordination, and (3) controls allocation of funds from federal and State funding sources.

To improve effectiveness, MTC could use the RTP to increase and encourage continued transit use by seeking legislation that would require: (1) transit agencies to comply with RTP transit improvement programs before they may receive any funds from federal or State sources, and (2) counties to prepare Countywide Transportation Plans that coordinate TSM, CIP, CMP objectives to reduce vehicle trips and traffic congestion and increase transit ridership.

4. San Mateo County Congestion Management Program (1991)

The CMP does not effectively promote transit use in the County. The CMP's effectiveness is limited because it does not (1) give priority to capital improvement projects that increase transit options for people traveling within the County, (2) adequately evaluate existing or potential transit demand within the County, (3) consider how coordination



between the County's existing transit systems could improve service quality and efficiency. Required annual CMP updates allow the Plan to be refined to reflect changing transportation conditions in the County.

The CMP would effectively increase transit use and reduce mobile source emissions if future plans are updated to (1) include objectives that are consistent with regional air quality goals, (2) give greater priority to capital improvement projects that increase capacity and efficiency of existing the County's transit system, (3) promote TSM projects that significantly reduce the transit travel time.

5. San Mateo County Transit District Short Range and Century Plans

The San Mateo County Transit District (SamTrans) Short-Range Transit Plan and Century Plan projects and programs have had limited effect on County transit ridership. Transit ridership in San Mateo County has decreased by three percent during the last decade.<sup>50</sup> The primary reason for this is that automobile travel is fast, flexible and affordable by comparison. These plans have expanded the number of SamTrans transit services (e.g., youth transit, para-transit, special events, and CalTrain) that successfully serve a small share of the County's total potential transit riders.

The Short-Range Transit Plan and Century Plans would increase total transit ridership if they promote projects or programs that (1) provide Half Moon Bay and the urban Mid-Coast with express/commute bus service to Daly City BART and CalTrans' Hillsdale Station, (2) provide all County residents and employees with frequent and dependable bus service to and from CalTrain stations, schools, commercial centers, and employment centers, (3) provide coordinated bus-train transfers for the entire scheduled CalTrain service, (4) develop a CalTrain/BART/Muni transfer terminal in downtown San Francisco, and (5) extend BART service to a transfer station west of San Francisco International Airport.

6. San Mateo County General Plan (1986) - Transportation and Land Use Policies

The San Mateo County General Plan transportation and land use policies support programs to enhance County transit opportunities. Their effectiveness is limited because they can only (1) guide development in the County's unincorporated areas, or (2) encourage, rather than require, further development of County transit services. These policies, however, effectively promote and support the San Mateo County TSM Plan and Ordinance.

The Plan's effectiveness would be strengthened by including policies that (1) require consistency between County roadway improvement projects and General Plan policies and other County programs, (2) encourage improved arterial operations within urban areas to foster efficient travel and minimize mobile source emissions, (3) identify transportation corridors where capacity would accommodate intensified development, and (4) consider the effect of proposed rural roadway improvements on land use development and air quality.

G. SUMMARY OF PROBLEMS

1. Land Use Development Policies and Regulations Do Not Fully Support Regional Air Quality Plans

- a. The County General Plan land use development policies and the zoning, subdivision, and grading regulations do not restrict stationary source emissions, nor do they control mobile source emissions associated with land use development. The County's policies and regulations are not specifically designed to reduce land use development's air quality impact. If they provide any air quality benefit, it is secondary to other objectives such as economic development, jobs/housing balance, transportation system management, and runoff/erosion control.
- b. The California Environmental Quality Act (CEQA) minimizes, but does not reduce, emissions generated by land use development. CEQA's air quality benefit is limited because (1) the development is evaluated after it is designed, (2) it can only recommend emission controls if the development would significantly degrade air quality, (3) it relies on local agency staff, many of whom are not technically trained to evaluate air quality impacts, and (4) may allow local agencies to approve projects with adverse air quality impacts due to other overriding considerations.

2. Existing Transportation Plans Not Coordinated and Do Not Fully Promote Improvement Projects that Reduce Congestion and Mobile Source Emissions at the Same Time

Existing transportation plans (e.g., CMP, Measure A, TSM, STIP, etc.) are not coordinated with one another and may individually promote improvement projects that may increase mobile source emissions. The Countywide transportation system is maintained or improved by a number of independent transportation plans. They are administered by different public agencies, pursue different objectives, compete for State and federal funding, and, with the exception of AB 434, consider mobile source emission reduction a secondary issue. As a result, the existing plans cannot effectively promote a Countywide transportation system that increases mobility and reduces mobile source emissions at the same time.

3. Local Plans and Programs do not Fully Support Regional Air Quality Objectives

The County's land use and the Countywide transportation-related plans and programs often fulfill local objectives without fully supporting regional air quality objectives. The Clean Air Plan goals rely on all levels of government to implement air quality programs or projects in a consistent and coordinated manner. If this does not occur, the region may not achieve its emission reduction goals and fail to attain federal and State air quality standards.

4. The Full Air Quality Benefits of the Clean Air Plan Are Limited by the Lack of Funding and Staff

The BAAQMD and related agencies do not have the necessary funding or authority to fully implement the Clean Air Plan's Phase II TCMs. These TCMs account for a significant share of the total emission reductions expected to be achieved by the CAP by 1997, i.e., 60 percent of total RHC reductions, 80 percent of total Nox reductions, and 87 percent of total CO reductions.

5. Existing Emission Control Technology is not Specifically Designed to Reduce PM10 and TAC Emissions

- a. The federal and State regional air quality plans do not require attainment of PM10 standards, nor do they require that PM10 emission controls be implemented. Ambient concentrations of this pollutant exceeds federal and State air quality standards and future concentrations are expected to increase. The EPA and CARB have conceded that it is not technically or economically feasible to directly reduce PM10 emissions and that PM10 violations will continue.
- b. The State Air Resources Board has not developed or implemented standards or regulations to limit mobile source TAC emissions. A significant part of total TAC emissions (60 percent) are generated by mobile sources and they pose a significant health threat to sensitive receptors located near high volume and congested roadways.



## VIII. ALTERNATIVES

The following are alternative approaches to address the inadequacies in current implementation measures to reduce emissions and attain federal and State air quality standards.

### A. REGULATE LAND USE DEVELOPMENT TO REDUCE AIR POLLUTION AND ITS PUBLIC HEALTH RISKS

1. The County's General Plan policies and development regulations can be amended to reduce land use development's air quality impact. General Plan could include policy to reduce stationary source emissions and minimize their health effect by: (1) prohibiting stationary sources and sensitive receptors to locate near one another, and (2) requiring land use development activities (e.g., demolition, construction, and grading) to use low-emission materials and processes. General Plan policy can reduce mobile source emissions associated with automobile travel by (1) planning high density, mixed use development near transit stations or commercial areas, (2) requiring land use development to include transit, pedestrian, bicycle improvements, (3) reduce parking requirements in areas served by transit, and (4) locating neighborhood-serving businesses in residential areas and employment centers. These policies could be implemented by the County's zoning and subdivision ordinances. They would provide long-term air quality benefits and increase local knowledge about emission sources in the County.
2. The CEQA environment assessment process could help reduce land use development's air quality impacts further if: (1) it occurred during the project design phase rather than during the permit application process, and (2) developers and local agency staff were provided information about air quality impacts of land use development. Specifically, BAAQMD could publish and distribute information or conduct training programs describing low-emission construction practices, air quality impact assessment methods, and effective impact mitigation controls. These actions would increase local understanding about air quality planning and impact mitigation techniques and enhance CEQA's long term air quality benefits.

### B. PLAN COUNTYWIDE TRANSPORTATION SYSTEM IMPROVEMENT TO REDUCE MOBILE SOURCE EMISSIONS

The County could promote and participate in a Countywide transportation planning program that plans transportation system improvements which increase mobility and reduce mobile source emissions in the County. The County Transportation Plan could define Countywide transportation objectives that guide transportation related plans and programs in the County. It could include goals to promote transportation system improvements and services that reduce congestion and improve air quality at the same time, and it could coordinate how these improvements would be funded. The Plan could integrate the Congestion Management Program (CMP), Sales Tax Expenditure Plan (Measure A), Transportation Systems Management Plan (TSM), AB 434 Clean Air Plan Funding Program, State

Transportation Improvement Program (STIP), SamTrans Short-Range and Long-Range Transit Plans, and federally funded transportation programs (ISTEA).

C. ADOPT PLANS, PROGRAMS, AND PROJECTS CONSISTENT WITH REGIONAL AIR QUALITY OBJECTIVES

Local land use and transportation plans must be consistent with regional air quality plans to ensure the region will attain federal and State air quality standards. The federal Air Quality Plan and the State Clean Air Plan call upon all levels government to implement programs and projects designed to reduce emissions within the Bay Area. The success of these programs and projects depends on cooperation between cities, counties, transit agencies, special districts, regional, and State agencies.

The County could help by (1) adopting General Plan policies and development regulations consistent with regional air quality objectives, (2) evaluating and implementing air quality programs and projects when appropriate, (3) encouraging that other public agencies adopt plans, programs, and projects consistent with regional air quality objectives. These actions would coordinate local land use and transportation planning activities and regional air quality planning objectives, and it would increase local understanding how to reduce or control emissions.

Regional agencies (e.g., BAAQMD and MTC) could help by consolidating the requirements of the CAP and the AQP into one regional air quality plan. This would simplify regional air quality objectives and increase common understanding on all levels of government which can help solve regional air pollution problems.

D. DEVELOP NEW FUNDING SOURCE AND AUTHORITY TO FULLY IMPLEMENT THE CLEAN AIR PLAN

Additional funding would ensure the 1997 emission reductions projected by the CAP are achieved. These funds are needed to implement CAP Phase 2 TCMs which increase transit mobility, improve traffic operations systems, and provide transit user incentives. One strategy is to increase taxes and fees that shift the cost of air pollution reduction from the general population to individuals who engage in emission generating activities. This strategy would also increase the cost of automobile travel and, thereby, encourage transit use.

The County could charge parking fees at its facilities. The resulting revenues could be used to subsidize transit user incentives such as employee transit passes, shuttle services, ride-share and other TDM programs.

The State agencies could impose smog-based vehicle registration fees and distribute the revenues to BAAQMD, MTC, and CalTrans to fund programs that increase transit mobility, improve traffic operations systems, and provide transit user incentives. However, new State legislation is needed before these fees can be implemented.

E. CONTINUE DEVELOPMENT OF ADVANCE EMISSION CONTROL TECHNOLOGY

Emission control technology can reduce emissions further. It significantly improved regional air quality since 1970, by reducing emissions generated by major point sources and automobiles. It can be used to reduce emissions further by (1) requiring all stationary sources and mobile sources to install emission control devices, and (2) replacing old emission generating processes, fuels, or materials with more efficient ones.

The County could ensure this technology is used as effectively as possible by (1) replacing its motor fleet with low emission vehicles, alternative fuel vehicles or hybrid vehicles, (2) purchasing and using low emission processes, fuels and materials at its facilities, and (3) requiring new land use development use best available emission control technology. By doing this, the County would create part of the market demand needed to support advancement of emission control technology.

Regional and State agencies (e.g., BAAQMD, MTC, CARB, EPA) play a vital role in this regard because they can institute emission requirements that effect regional and Statewide demand for emission control technology. By adopting more stringent emission standards for all types of stationary sources and mobile sources these agencies create demand for emission control devices. In some cases, these requirements might force businesses to eliminate polluting processes, fuels, or material or drivers to retire older, emission-inefficient vehicles.

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## AIR RESOURCES ENDNOTES

1. BAAQMD, "1991 Clean Air Plan."
2. BAAQMD, "Air Quality Guidelines," Tables V-B-3 to V-B-5.
3. MTC, Regional Transportation Plan, EIR, page 5.5; ABAG, 1983.
4. Richard H. Thuiller, Air Quality Considerations in Residential Planning Volume 2, page 9, May 1978.
5. BAAQMD "91 Clean Air Plan."
6. BAAQMD, Air Quality Guidelines, Table V-B-4, Ozone - Number of Days with Max-Hour Concentrations Exceeding 12 pphm.
7. Conversation, Michael Murphy, BAAQMD, January 1992.
8. Steve Luke, conversation, BAAQMD, Toxic Air Contaminant Division, April 17, 1992.
9. BAAQMD, 1991 Status Report: BAAQMD Toxic Air Contaminant Control Program, Table V. TAC detected by BAAQMD include: Vinyl Chloride, Dichloromethane, Chloroform, Ethylene Dichloride, Trichloroethane, Carbon Tetrachloride, Trichloroethylene, Benzene, Ethylene Dibromide, Perchloroethylene and Toluene.
10. BAAQMD, Memorandum, "Status of the BAAQMD Toxic Air Contaminant Control Program," July 30, 1991, page 34.
11. BAAQMD, Status of the BAAQMD Toxic Air Contaminant Control Program Annual Report, 1991, page 1.; Evaluation Section, "Questions and Answers about the Air Toxics "Hot Spots" Assessment Program (AB 2588). It is assumed that County mobile and stationary emission sources generate TAC at the same rate as observed elsewhere in the Bay Area.
12. BAAQMD, 1991 Status Report: BAAQMD Toxic Air Contaminant Control Program, Appendix C Toxic Air Contaminant Emission Inventory.
13. BAAQMD, Odors Public Information Handout, undated.
14. Rochelle Walker, BAAQMD, Enforcement Division, conversation 92.04.17.
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16. MTC, Bay Area Travel Forecasts, Congestion Management Program Databook #4: San Mateo County, April 1991, page 13, Table 5, Mode of Choice Forecasts - 1987 & 2000 San Mateo County.

17. MTC, Congestion Management Plan Databook #4: San Mateo County, 1991, page 4.
18. California Air Resources Board, EMFAC7E Emission Factors, CO, September 1990. Average emissions data for 1990 vehicle fleet mix with catalytic and non-catalytic emission systems.
19. Richard H. Thuiller, Air Quality Considerations in Residential Planning Volume 2, page 9, May 1978.
20. ABAG, Projections 90 - San Mateo County, page 193.
21. Phone Conversation, 92.04.17, Rochelle Walker, BAAQMD, Enforcement Division. In 1990, BAAQMD received about 125 complaints about offensive odors from stationary sources located in San Mateo County. Eight of these complaints lead to BAAQMD citations. Typically, complaints regarding odors are from residents near such sources as a chemical manufacturer, autobody shop or a sewage treatment plant.
22. Erwin Mussen, BAAQMD, phone conversation, April, 1992.
23. BAAQMD, Status of the Bay Area Management District Toxic Air Contaminant Control Program: 1991 Annual Report, page. 7-11.
24. BAAQMD, Bay Area '91 Clean Air Plan, Volume VI, Appendix H, Source Inventory Description, page 4. Assumes that San Mateo County 1987 PM10 road dust generation is the same as percent PM10 generated by road dust in the Bay Area in 1987.
25. Mark Luke, conversation, BAAQMD, April 17, 1992. Initially, the BAAQMD 1991 Toxic Air Contaminant Control Program Annual Report listed Southern Pacific Pipelines in Brisbane as a high risk facility (Class III). TAC emissions from this facility have since been reduced by emission control devices and no longer poses a public health threat.
26. BAAQMD, "1991 Clean Air Plan."
27. BAAQMD, Bay Area '91 Clean Air Plan, Volume IV, page H-24.
28. City and County of San Francisco, San Francisco International Airport Master Plan, Final Environmental Impact Report, Table 59: Estimated Daily Aircraft Emissions at SFIA, 1990-2006
29. City and County of San Francisco, San Francisco International Airport Master Plan, Final Environmental Impact Report, Table 59: Estimated Daily Aircraft Emissions at SFIA, 1990-2006
30. BAAQMD, Status of BAAQMD Toxic Air Contaminant Control Program Annual Report, 1991, page 2.
31. Mark Luke, conversation, BAAQMD, April 17, 1992.

32. CARB, EMFAC7EP, Composite Emission Factors by Pollutant and Speed for Gasoline Vehicles, 1991.
33. MTC, Bay Area Travel Forecasts, Congestion Management Program Databook #4: San Mateo County, April 1991, page 13, Table 5, Mode of Choice Forecasts - 1987 & 2000 San Mateo County.
34. This is based on MTC's estimate that San Mateo County VMT in 2010 will decrease by 2.6 percent if proposed County highway improvements are constructed or increased by 2.4 percent if not. MTC, RTP EIR, 1991, page 4.17, Table 4.7.
35. MTC, Congestion Management Program Databook #1: Regional Summary, 1991, page 52, Table 16 Average Weekday Passenger Miles of Travel by Bay Area Transit Operators. CalTrain is expected to increase weekday passenger miles by 188.9 percent by 2000 while SamTrans decreases by 25.7 percent. Data for BART service within San Mateo County are not available.
36. MTC, Bay Area Travel Forecasts, Congestion Management Program Databook #4: San Mateo County, April 1991, page 16, Table 7, A.M. Peak Hour Traffic Forecasts - 1987 & 2000, San Mateo County - VMT by V/C by Facility Type.
37. ABAG, Projections 90 - San Mateo County, page 193.
38. San Mateo County Transportation Authority, Transportation System Management Plan, 1990, Figure 2 Major Employment Centers. Area based on land within the zoned for industrial and commercial development, including developed and undeveloped land.
39. Association of Bay Area Governments, Projections '90, San Mateo County, page 209. Table, Total Jobs by Subregional Area.
40. Employment Development Department, Annual Planning Information - San Mateo County, June, 1991, page 8.
41. Assembly Bill 2588, The Toxic "Hot Spots" Information and Assessment Act, enacted by California State Legislature in 1987.
42. City/County Association of Governments of San Mateo County, 1991 San Mateo County Congestion Management Plan, page 1.
43. Section 44223 of the California Health and Safety Code.
44. BAAQMD, Memorandum, January 16, 1993, AB 434 Fact Sheet.
45. Section 44241 of the Health and Safety Code.
46. BAAQMD, Memorandum, January 16, 1993, page 2. Review Criteria Fiscal Year 1993-94.
47. Atherton, East Palo Alto, Hillsborough, Portola Valley, and Woodside are not required to implement TDM programs because they do not have large employers within their jurisdictions.



48. Office of Planning and Research, Significant Effects, Appendix G, 1986.
49. San Mateo County Code section 6271(a), 6289.1.2, 6324.1.(b) to (e).
50. San Mateo County Transit District, Short Range Transit Plan, 2000-2001, page 11-5.



# Air Resources

Policies







## AIR RESOURCES POLICIES

Consistent with federal and State air quality plans and requirements, the County will:

### GOALS AND OBJECTIVES

#### 17.1 Protect and Preserve Clean Air as a Natural Resource

Protect and preserve clean air as an essential natural resource needed to sustain healthy plant, animal, and human life within San Mateo County and the Bay Area.

#### 17.2 Reduce Air Pollutant Emissions

Reduce the amount of air pollutant emissions released by land use activity and automobile travel within the County.

#### 17.3 Reduce Public Exposure to Harmful Air Pollution

Reduce public exposure to harmful air pollution by identifying and designating sensitive receptors and regionally significant emission sources within the County.

### DEFINITIONS

#### 17.4 Definition of Air Resource

Air resources include that part of the earth's atmosphere that plants, animals and people breathe outside of buildings and which mix with and disperse emissions generated by natural and man-made sources.

#### 17.5 Definition of Air Pollutant

Air pollutants are by-products of a variety of man-made processes including fuel combustion, industrial and commercial processing, and petroleum product and solvent evaporation that harm public health and damage plants and property.

#### 17.6 Definition of High Pollutant Concentrations

Any air pollutant concentration exceeding ambient threshold standards established by the California Air Resources Board or the federal Environmental Protection Agency, whichever is most strict.

#### 17.7 Definition of Indirect Source

Indirect sources are major land uses that attract a large number of motor vehicles which concentrate mobile source emissions on nearby roadways and intersections. Examples of indirect sources include large

employment and shopping centers, regional airports and schools. An indirect source may also be a stationary source, e.g., a factory that emits a large amount of pollutants and employs a large number of employees who drive to work.

#### 17.8 Definition of Mobile Sources

Mobile sources are motor vehicles that emit air pollutants and include "on-road" vehicles (e.g., motorcycles, automobiles, light and heavy duty trucks, heavy duty buses), "off-road" vehicles (e.g., utility equipment, farm equipment, heavy and light duty industrial/construction equipment, locomotives, off-road motorcycles, ships and boats), and aircraft. Concentrations of mobile sources on regularly congested roadways can be further defined as "line" sources.

#### 17.9 Definition of Significant Emission Source

Significant emission sources are land uses or facilities that either emit (1) criteria pollutants in excess of federal or State emission standards, or (2) offensive odors or dust which pose a public nuisance. Examples include, but are not limited to, factories, dry cleaners, sewage treatment plants, construction sites, routinely congested or high volume arterials and freeways, and any land use that attracts vehicle trips from the region (e.g., shopping and employment centers, colleges, airports).

#### 17.10 Definition of Sensitive Receptors

Any land use commonly associated with persons apt to suffer adverse health effects when exposed to air pollutants especially children, physically active adults, the elderly, and other persons suffering from chronic or acute respiratory illness and defined as sensitive receptors. Examples include, but are not limited to, schools, playgrounds, athletic facilities, child care centers, retirement homes, convalescent homes, hospitals and clinics.

#### 17.11 Definition of Stationary Source

Stationary sources are industrial or commercial processes that emit air pollutants into the atmosphere. Stationary sources include industrial and commercial areas where air pollutants are regularly emitted by fixed vents or stacks. Stationary sources include "point" sources (e.g., industrial/commercial facilities that include processes or equipment that generate large amounts of pollutants), and "area" sources which include products, processes and activities that produce small amounts of pollutants.

#### 17.12 Definition of Transit Agency

Transit agency includes any public agency providing bus, rail or any other transit service within San Mateo County, including San Mateo County Transit District (SamTrans), Santa Clara County Transit District



(SCCTD), San Francisco Municipal Railway (MUNI), Peninsula Commute Service (CalTrain), and Bay Area Rapid Transit District (BART).

## DESIGNATIONS

### 17.13 Designate Significant Emission Sources

Designate as a significant emission source the following sites:

- a. Those sites identified as High Volume, Congested Roadways and Congested Intersections identified by the Mobile Source Emissions Map.
- b. Those sites identified as Stationary Area Sources and Stationary Point Sources identified by the Stationary Source Emissions Map.

### 17.14 Designate Transit Corridors

Designate as transit corridors the area within 1/4 mile of arterials located within the SamTrans Service Area and CalTrain and BART stations as shown on the Transit System, Railway, and Seaport Map.

## REGULATION OF DEVELOPMENT

### 17.15 Reduce Air Pollutants, Odors and Dust from Stationary Sources by Regulating Land Use Development

Reduce air pollutants, offensive odors and dust from stationary sources to the maximum practicable extent by:

- a. **Requiring** that all demolition, grading (excluding agriculture) and construction projects conform with applicable BAAQMD recommended dust control measures, including, but not limited to, surface wetting and seeding.
- b. **Requiring** that all land uses (excluding agriculture) conform with applicable BAAQMD recommended odor control measures, including, but not limited to, incineration, carbon filtering and chemical scrubbing.
- c. **Requiring** surface mining, oil and gas operations and industrial development to reduce their dust, odor and other air quality impacts, consistent with Mineral Resource Policy (3.13, 13.15, 13.16).
- d. Referring to BAAQMD all development projects identified by BAAQMD Regulation 2 as requiring air quality permit review, including, but not limited to, gasoline stations, dry cleaning plants, solid waste disposal sites, print shops, and auto body shops. This policy does not apply to (1) residential dwellings, (2) motels/hotels, (3) restaurants, (4) office and commercial buildings where the only emissions are from gas-fired space heating, and (5) agriculture.

17.16 Reduce Public Exposure to Air Pollutants, Offensive Odors and Dust by Land Use Planning

Reduce public exposure to air pollutants, offensive odors and dust by planning the distribution of land uses in the following ways:

- a. Designating sensitive receptor areas outside of high pollution concentration areas.
- b. Establishing buffer zones between sensitive receptors and significant emission sources.
- c. Establishing buffer zones between residential land uses and any land use known to cause offensive odors or dust, consistent with Mineral Resource and Urban Land Use Chapter policies to protect adjacent land uses (Policies 3.12-3.20 and 8.24). Examples include, but are not limited to, sewage treatment plants, landfill sites, and chemical manufacturing.
- d. Allowing stationary sources to locate in areas designated by the General Plan for industrial and commercial development.

17.17 Reduce Mobile Source Pollution by Integrating Land Use and Transportation Planning

Reduce mobile source pollution in urban areas by integrating land use and transportation planning to increase transit use, support walking and bicycling, and reduce the need for automobile travel in the following ways:

- a. Designating areas to maximize residential and office development density within 1/4 mile of transit stations or commercial areas, compatible with surrounding land uses.
- b. Designating commercial areas for neighborhood retail and service businesses within or adjacent to residential and employment sites that serve local residents or employees, compatible with surrounding land uses.
- c. Encouraging development of vacant or under-utilized parcels (e.g., infill development) in urban areas, according to Urban Land Use Chapter policies.
- d. Requiring direct and safe pedestrian and bicycle access to transit stations and commercial areas from nearby residential neighborhoods and employment centers, consistent with Transportation Chapter policy to encourage pedestrian paths and bicycle routes (Policies 12.34, 12.39 and 12.40). Examples include, but are not limited to, walkways, bike lanes and signalized pedestrian crossings on roadways leading to transit stations and commercial areas, and direct walking access through commercial areas to adjoining transit stations.

- e. **Requiring** secure bicycle parking facilities at transit stations, in commercial areas, and employment centers that are centrally located, close to building entrances and visible from the street, consistent with Transportation Chapter policies to promote bicycle use (Policies 12.36 and 12.38). Examples include, but are not limited to, bicycle racks and employee dressing rooms with lockers and showers.
- f. **Requiring** that development, in transit corridors, provide on-site improvements which encourage transit use and support walking. Examples include, but are not limited to, transit shelters, preferential on-site transit access, safe street crossings, visible and direct sidewalks to adjacent land uses.
- g. **Requiring** that indirect sources, in transit corridors where adequate levels of service are provided by other transportation systems, incorporate on-site controls that limit the provision of automobile parking and encourage ride-sharing. Examples include, but are not limited to, reduced parking requirements, neighborhood parking restrictions, and preferential vanpool/carpool parking near building entrances.

## **PROGRAM RESPONSIBILITIES**

### **Role of the County**

#### **17.18 Revise and Maintain Policies, Regulations and Programs Consistent With Regional Air Quality Plans**

Revise and maintain County policies, regulations and programs to be consistent with regional air quality plans. Examples include, but are not limited to:

- a. Amending the County General Plan, especially the Land Use, Transportation, Housing, and Man-Made Hazard chapters to support this Air Resources Chapter.
- b. Amending the County subdivision, grading and zoning ordinances to incorporate appropriate emission control measures recommended by the BAAQMD.

#### **17.19 Request BAAQMD to Participate in Pre-Application Review for Selected Projects**

Request BAAQMD to participate in pre-application review of development projects which may have significant air quality impacts. BAAQMD could identify best emission control technology or practices to be incorporated into the project design.

#### **17.20 Request BAAQMD to Include San Mateo County Participation**

Request BAAQMD to include San Mateo County participation in development of regional air quality programs and regulations.



17.21 Demonstrate Low-Emission Practices and Trip Reduction Programs

Demonstrate as an example to the business community how employers can improve regional air quality by:

- a. Using practices and products at County facilities that reduce air pollution, including, but not limited to, energy conservation, clean fuel cars and low-emission paints.
- b. Maintaining trip reduction programs to encourage County employees to commute to work by transit, ride sharing, walking and bicycling.

17.22 Encourage Cities and Other Agencies Within the County to Adopt Plans and Fund Projects Consistent With Regional Air Quality Plans

Encourage cities, transit agencies and other government agencies within the County to adopt plans and fund projects consistent with regional air quality plans. Examples include, but are not limited to:

- a. Distributing the County General Plan Air Resource Chapter to cities within the County.
- b. Working with C/CAG to incorporate air resource policies in Countywide transportation plans and programs.
- c. Providing air quality information to other government agencies within the County.

17.23 Support Federal Legislation and Regulations to Reduce the Air Quality Impact of Aircraft Operations

Support federal legislation and regulations to reduce airport-related air pollutant emissions by controlling aircraft ground operations including, but not limited to, aircraft idling and taxiing.

Role of C/CAG

The County will encourage C/CAG to:

17.24 Facilitate a Planning Process to Establish Unified Policy that Balances Transportation, Land Use, and Air Quality Planning Objectives

Facilitate a process to develop the County Transportation Plan to establish unified transportation policy that requires all transportation system improvements to balance congestion management, land use development, and air quality improvement, consistent with federal and State air quality plans. The Plan would:

- a. Include the perspectives of local governments, transportation and air quality agencies, and relevant citizen advocacy groups.
- b. Define transportation system goals and establish improvement priorities.

- c. Coordinate all Countywide transportation plans including, but not limited to, the Congestion Management Program (CMP), Sales Tax Expenditure Plan (Measure A), Transportation Systems Management Plan (TSM), Vehicle Registration Fee Program (AB 434), State Transportation Improvement Program (STIP), SamTrans Short-Range and Long-Range Transit Plans, and federally funded transportation programs (ISTEA).

17.25 Refine the San Mateo County CMP to Better Balance County Congestion Management Goals With Regional Air Quality Objectives

Refine the San Mateo County CMP planning process to better promote transportation system improvements that not only reduce congestion but improve air quality at the same time. C/CAG can accomplish this by:

- a. Expanding the CMP Travel Demand Forecasting Model to evaluate large-scale land use and transportation improvement project impacts on air quality.
- b. Continuing to develop new methods to better evaluate the effect of all CIP projects on traffic congestion and air quality.
- c. Developing criteria to pre-screen candidate CIP projects which reduce congestion and improve air quality at the same time.

17.26 Promote New State Legislation Requiring the CMP to be Consistent with Federal and State Air Quality Plans

Promote new State legislation requiring the Congestion Management Program (CMP) to be consistent with federal and State Air Quality Plans by requiring the CMP to promote transportation system improvements which reduce congestion by reducing vehicle trips, vehicle miles of travel, and single-occupant vehicle travel.

Role of Transit Agencies

The County will encourage Transit Agencies to:

17.27 Participate in Countywide Transportation Planning Process

Participate in the development of a County transportation planning process to establish unified transportation policy that requires all transportation system improvements to balance congestion management, land use development and air quality improvement, consistent with federal and State air quality plans, as described in Policy 23.

17.28 Continuously Evaluate County Transit Service

Continuously evaluate transit service within the County, particularly within transit corridors, to ensure the public is provided the most timely and cost-efficient transit service possible between residential areas, employment centers, commercial districts, and other major destinations within the County.

#### 17.29 Reduce Transfer Time Between Connecting Transit Services

Reduce transfer time between connecting transit services by coordinating bus and train schedules and developing direct bus access to transit facilities, particularly train stations.

#### 17.30 Use Low-Emission, Alternative Fuel, or Hybrid Vehicles

Use low-emission, alternative fuel, or hybrid vehicles including electric buses and trains to the maximum extent possible to reduce mobile source emissions.

#### Role of ABAG

The County will encourage ABAG to:

#### 17.31 Work with BAAQMD, MTC and Local Agencies to Prepare an Air Quality Handbook

Work with BAAQMD, MTC and local agencies to prepare an air quality handbook that describes how the County (and other local agencies) can plan land uses and transportation system improvements that reduce subregional (i.e., Countywide) emissions and help improve regional air quality. The handbook should describe: (1) subregional air quality conditions and emissions sources, (2) applicable plans, programs and regulations, and (3) land use and transportation policy and implementation programs the County (and other local agencies) can use to improve air quality.

#### Role of BAAQMD

The County will encourage BAAQMD to:

#### 17.32 Assist Local Government Air Quality Programs

Assist local governments in preparing and implementing local air quality programs by distributing information, conducting training programs and providing technical assistance. Assistance may include, but is not limited to, providing local air quality information, low-emission construction guidelines, and air quality impact assessment training.

#### 17.33 Work with ABAG, MTC and Local Agencies to Prepare an Air Quality Handbook

Work with ABAG, MTC and local agencies to prepare an air quality handbook that describes how the County (and other local agencies) can plan land uses and transportation system improvements that reduce subregional (i.e., Countywide) emissions and help improve regional air quality. The handbook should describe: (1) subregional air quality



conditions and emissions sources, (2) applicable plans, programs and regulations, and (3) land use and transportation policy and implementation programs the County (and other local agencies) can use to improve air quality.

17.34 Consolidate Federal and State Air Quality Regulations

Consolidate federal and State air quality regulations into a single plan to unify and clarify regional air quality regulations.

17.35 Advocate Revenue Measures to Fully Fund the Implementation of the Clean Air Plan

Advocate revenue measures based on activities that generate emissions including, but not limited to, vehicle emission based automobile registration fees, bridge tolls, and gas surcharges (i.e., "market-based" measures), which can be used to fully fund the implementation of the Clean Air Plan.

17.36 Develop Improved Emission Controls

Develop and implement improved emission control devices or best available control technology that further reduce all pollutant emissions, particularly toxic air contaminants (TAC) and suspended particulate matter (PM10).

Role of MTC

The County will encourage MTC to:

17.37 Plan and Promote Transportation System Improvements that Reduce Vehicle Trips and Vehicle Miles of Travel

Plan and promote transportation system improvements that reduce mobile source emissions by reducing vehicle trips and vehicle miles of travel. Examples include, but are not limited to, improvements that:

- a. Increase transit service capacity, frequency and coordination, especially within congested transit corridors.
- b. Extend existing HOV lanes within the County.
- c. Improve traffic operations along congested roadways.

17.38 Develop Better Transportation Improvement Air Quality Evaluation Method

Continue to develop methods to better evaluate the effect of transportation improvement projects on air quality, vehicle trips, and vehicle miles of travel.



17.39 Work with BAAQMD, ABAG and Local Agencies to Prepare an Air Quality Handbook

Work with BAAQMD, ABAG and local agencies to prepare an air quality handbook that describes how the County (and other local agencies) can plan land uses and transportation system improvements that reduce subregional (i.e., Countywide) emissions and help improve regional air quality. The handbook should describe: (1) subregional air quality conditions and emissions sources, (2) applicable plans, programs and regulations, and (3) land use and transportation policy and implementation programs the County (and other local agencies) can use to improve air quality.

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